1995 Annual Epidemiologic Surveillance Report for **Sandia National Laboratory – Albuquerque**

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Introduction

The U.S. Department of Energy's (DOE) conduct of epidemiologic surveillance provides an early warning system for health problems among workers. This program monitors illnesses and injuries that result in an absence of five or more consecutive workdays, occupational injuries and illnesses, and disabilities and deaths among current workers.

This report provides a summary of epidemiologic surveillance data collected from the Sandia National Laboratory-Albuquerque (SNL-AL) from January 1, 1995 through December 31, 1995. The data were collected by a coordinator at SNL-AL and submitted to the Epidemiologic Surveillance Data Center, located at Oak Ridge Institute for Science and Education, where quality control procedures and data analyses were carried out.

The annual report for 1995 has been redesigned from reports for previous years. Most of the information in the previous reports is also in this report, but some material now appears in the appendices instead of the main body of the report. The information presented in the main body of the report provides a descriptive analysis of the data collected from the site and the appendices provide more detail. A new section of the report presents trends in health over time. The Glossary and an Explanation of Diagnostic Categories have been expanded with more examples of diagnoses to illustrate the content of each category.

The data presented here apply only to SNL-AL. The DOE sites are varied, so comparisons of SNL-AL with other DOE sites should be made with caution. It is important to keep in mind that many factors can affect the completeness and accuracy of health information collected at the sites as well as affect patterns of illness and injury observed.

Sandia National Laboratory-Albuquerque (SNL-AL) AT A GLANCE—1995:

- Absence rates for cancer, heart/circulatory disease, and injury and poisoning changed little over the three-year period among women in the Sandia work force. The rates for cancer, lung/respiratory disease, and nonoccupational injury dropped significantly among men.
- The most frequently reported diagnosis categories remained the same from 1993 through 1995. Diagnoses involving the lung/respiratory system, the muscles and skeleton, and injuries consistently had the highest rates among both men and women.
- About 8% of the work force reported at least one health-related absence in 1995. The percentage of women with at least one absence (12%) was twice that of men (6%). This gender difference has been seen at Sandia every year since the site's first Epidemiologic Surveillance report in 1993.
- We saw little change in the rates of occupational injuries. Neither age nor gender was strongly related to the occurrence of OSHA-recordable injuries.
- Sprains, strains, and bruises were among the most common types of OSHA-recordable injuries for both men and women. Sprains and strains accounted for almost half of the OSHA-recordable injuries in 1995. Age and occupation did not appear related to the type of accident or the type of injury sustained.
- Compared with other workers, security workers were 6 times more likely to suffer back sprains and strains and over 16 times more likely to suffer other sprains and strains. These workers were also about 8 times more likely to experience bruises. Clerical staff and crafts and manual labor workers were also at high risk for sprains and strains.

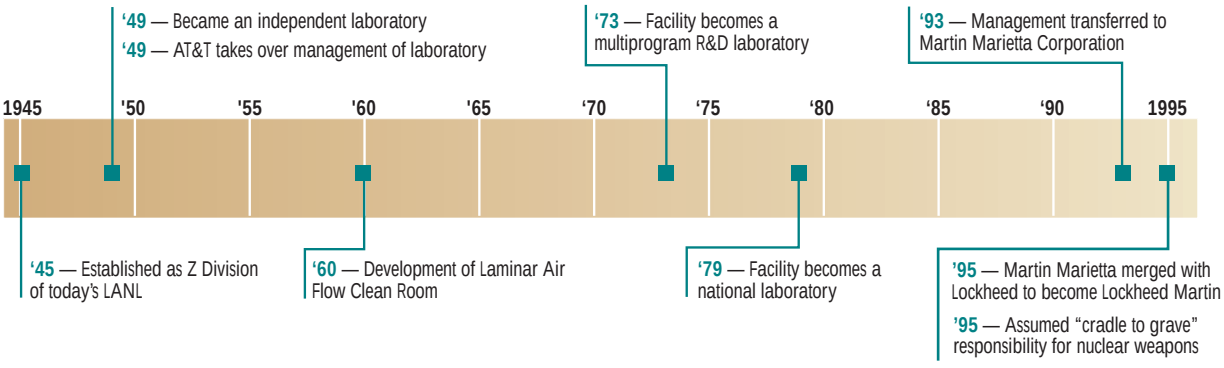
Site Overview

SNL-AL, a government-owned/contractor-operated facility funded primarily by DOE, is located at the foot of the Manzano Mountains adjacent to the city of Albuquerque, New Mexico. The facility has 547 major buildings and is essentially surrounded by Kirtland Air Force Base. Sandia has served for more than 50 years as one of the major national defense research and development (R&D) laboratories. The facility started in 1945 as Z Division of what is now Los Alamos National Laboratory (LANL). As part of the Manhattan Project that built the first nuclear weapons, the site's mission was ordnance design, testing, and assembly. When the facility became an independent laboratory in 1949, President Harry Truman asked the American Telephone and Telegraph Company (AT&T) to take over management of the site which continued for nearly 44 years. AT&T managed the facility through the Sandia Corporation.

The original mission of SNL-AL's R&D nuclear weapons activities expanded to include support of the space program as well as work on other advanced military technologies, energy programs, arms verification, and control technology and applied research. This expanded role included the development of the Laminar Air Flow Clean Room in 1960, making possible the assembly of microelectronics. This technology has had an ongoing and critical impact on the space program, manufacturing, medicine, and the biomedical and pharmaceuticals industries.

The specifics of Sandia's mission continue to evolve to meet the challenges of a changing world, but the site's core mission remains stewardship and development of the nation's nuclear stockpile. In 1995, Sandia's "cradle to grave" assumption of responsibility for nuclear weapons includes partnering with the other national laboratories, the military services, and industry to ensure the reliability of the weapons and to oversee their removal from the nuclear stockpile when they are retired. Sandia also continues to maintain vital programs in environmental testing, radiation research, combustion research, computing, microelectronics research and production, and other related fields.

On October 1, 1993, management of the facility changed from AT&T to the Martin Marietta Corporation. In 1995, Martin Marietta merged with Lockheed to become Lockheed Martin. When Lockheed Martin succeeded AT&T, the same basic need remained at SNL-AL for a synergistic blend of research and manufacturing orientation.



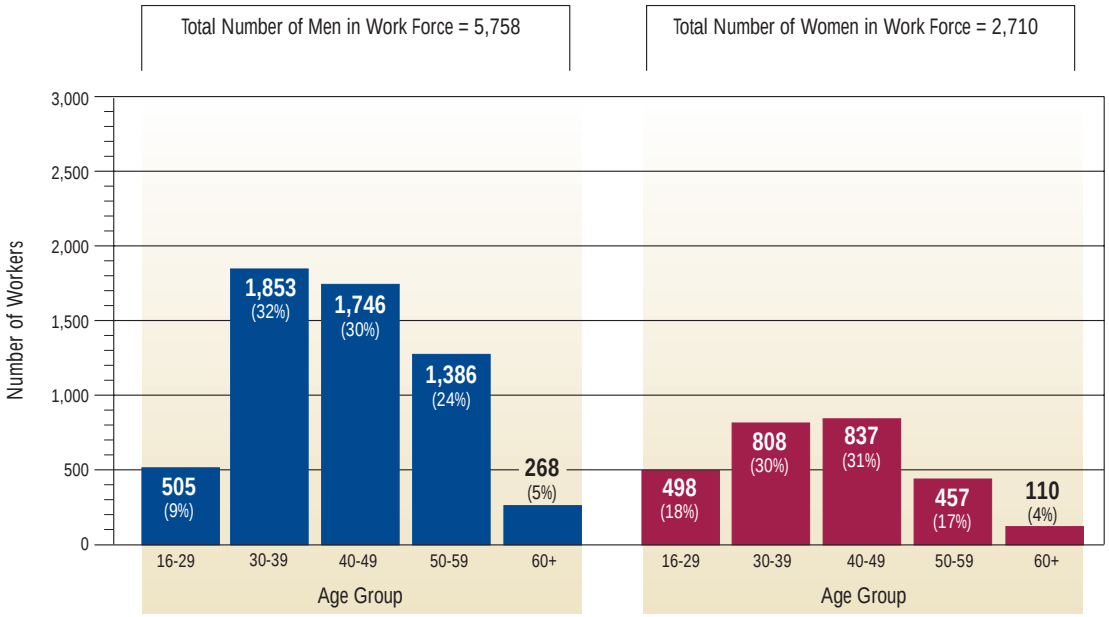
Timeline of Major Activities at SNL-AL

The Sandia Work Force

A total of 8,468 Sandia employees were included in epidemiologic surveillance in 1995, 212 fewer than in 1994. There were over twice as many men (5,758) as women (2,710). The Sandia work force was younger than the general population. The average age of male Sandia workers was 43 years and 40 years among females (figure 1). The majority of the Sandia workers was White (71%). Hispanics comprised about 21% of the work force; African Americans, Asians, and Native Americans made up the remainder (figures 2a and 2b).

Not all occupations pose equal risks for illness or injury, so we compared rates among broad occupational categories to determine whether some occupational groups were at greater risk than others for these diagnoses. The number of illnesses or injuries reported in any specific occupation may be very small in a given year, or the number of workers in a given occupation may be small. These small numbers limit the certainty with which illness and injury rates can be calculated and compared. The analyses in this report use broad occupational categories (figure 3) because there were not enough diagnoses in many specific occupations to permit more detailed analyses. You can find which occupational category you are in by referring to figure 4, which lists many of the job titles that are grouped into each of the categories used for the analyses. Men and women were not distributed equally among the occupational groups. We noted the largest gender differences in the professional staff and clerical groups (figure 3). Appendix A contains a more detailed distribution of the work force by gender, age, and occupational group.

Figure 1. The Work Force by Gender and Age



Figures 2a and 2b. Racial Composition of the Work Force by Gender

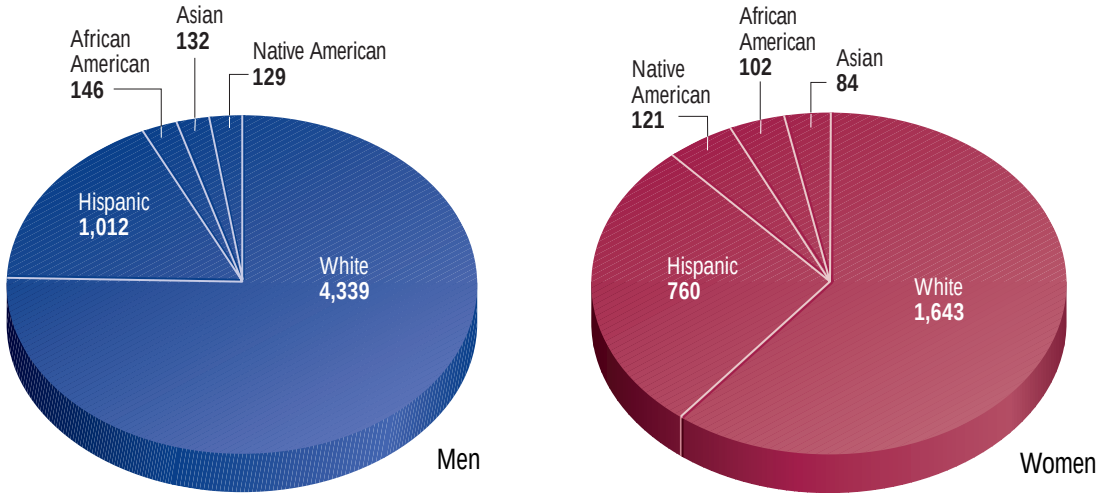


Figure 3. The Work Force by Gender and Occupation

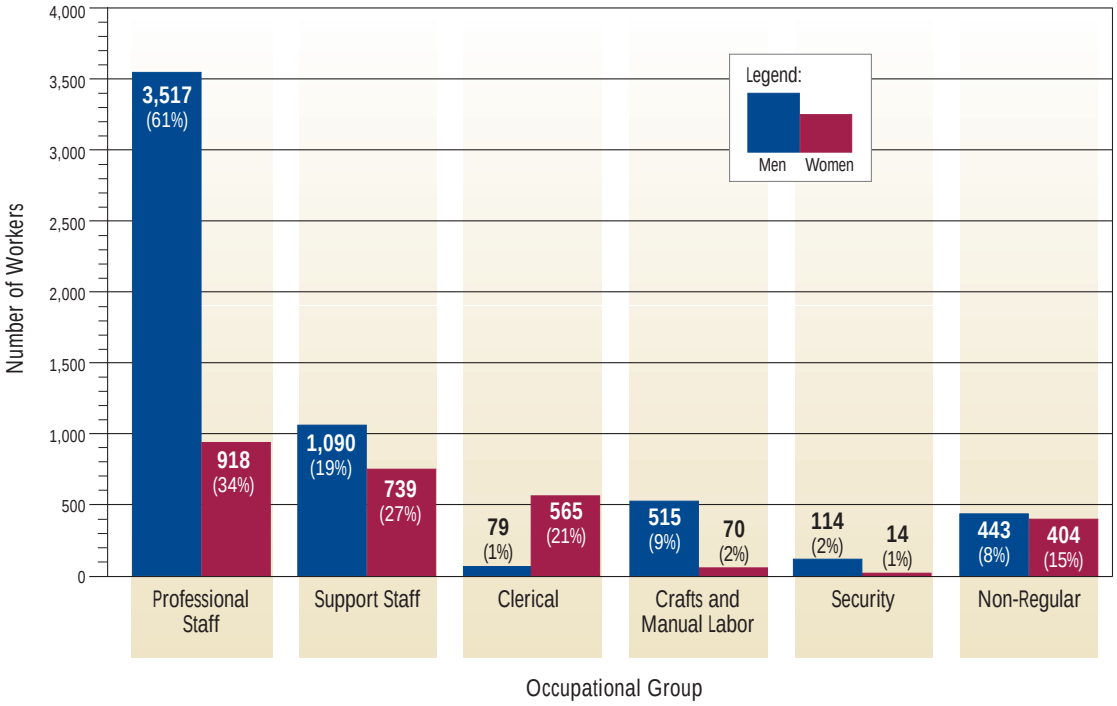


Figure 4. Most Common Job Titles in Each Occupational Group

PROFESSIONAL STAFF	**SUPPORT STAFF**	**CLERICAL**	**SECURITY**
MANAGEMENT	TECHNOLOGIST	OFFICE AND PROFESSIONAL EMPLOYEES	SECURITY POLICE ASSOCIATION
SPECIAL APPOINTMENT	ADMINISTRATIVE STAFF ASSOCIATE		
TECHNICAL STAFF	MGMT ASSOCIATE/SECRETARIAL STAFF	**CRAFTS AND MANUAL LABOR**	**NON-REGULAR**
LABORATORY STAFF	LAB MAINT STAFF/MFG TECH	METAL TRADES COUNCIL	TEMPORARY EMPLOYEES

Work Force Demographics

The Sandia work force decreased from 8,680 workers in 1994 to 8,468 workers in 1995. The 1993 Sandia work force was similar in size to the current group of workers. Women made up about 30% of the work force each year. The age distribution of the work force remained stable over the three-year period (figures 5 and 6), as did the occupational distribution of workers (figures 7 and 8).

Figure 5. Percentage of Men in Different Age Groups, 1993 to 1995

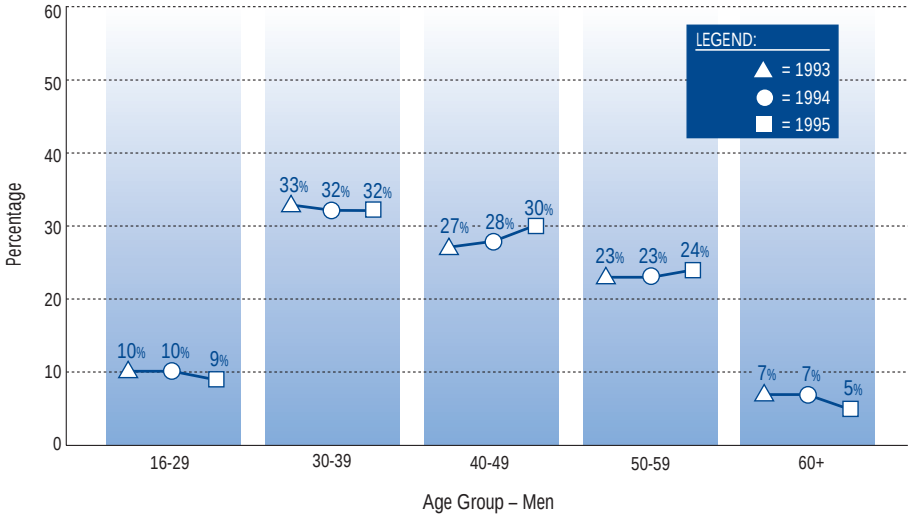


Figure 6. Percentage of Women in Different Age Groups, 1993 to 1995

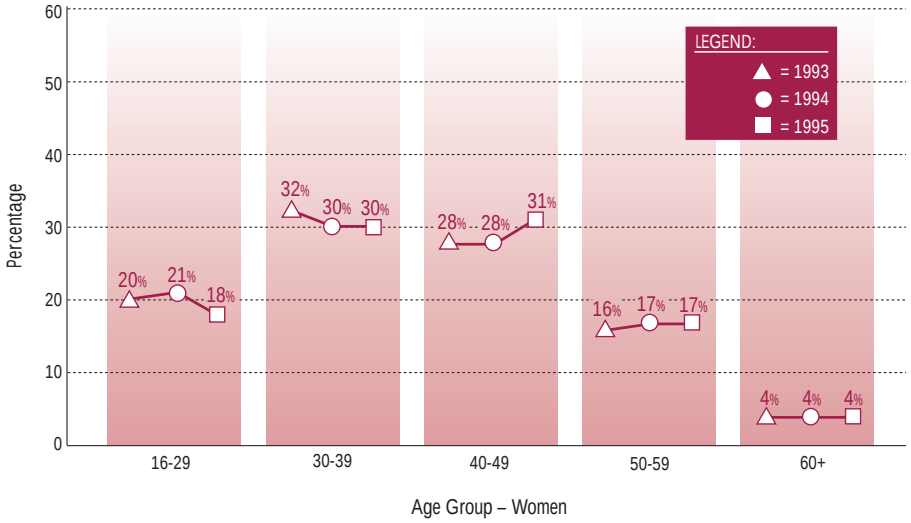


Figure 7. Percentage of Men in Different Occupational Groups, 1993 to 1995

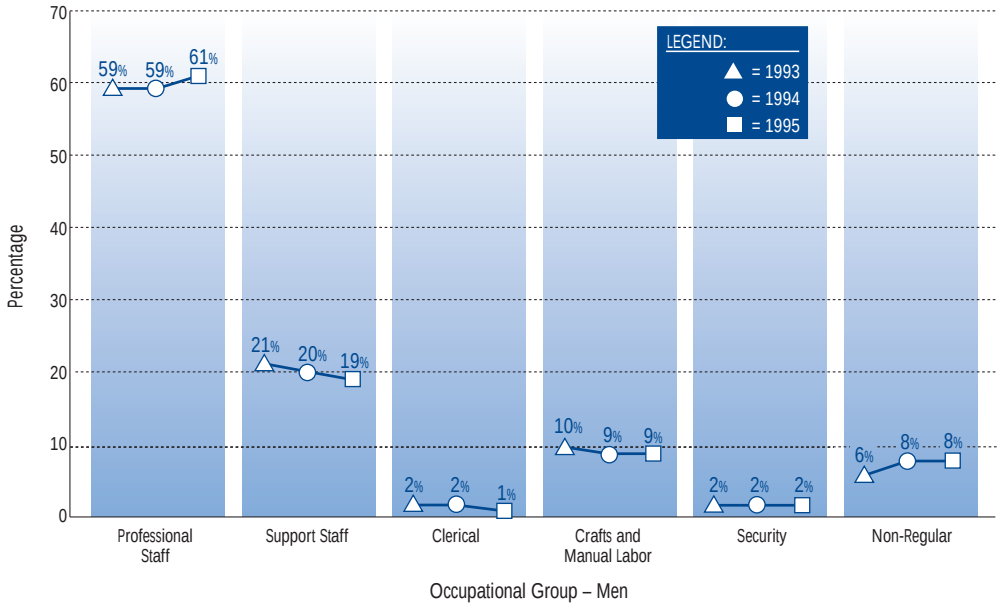
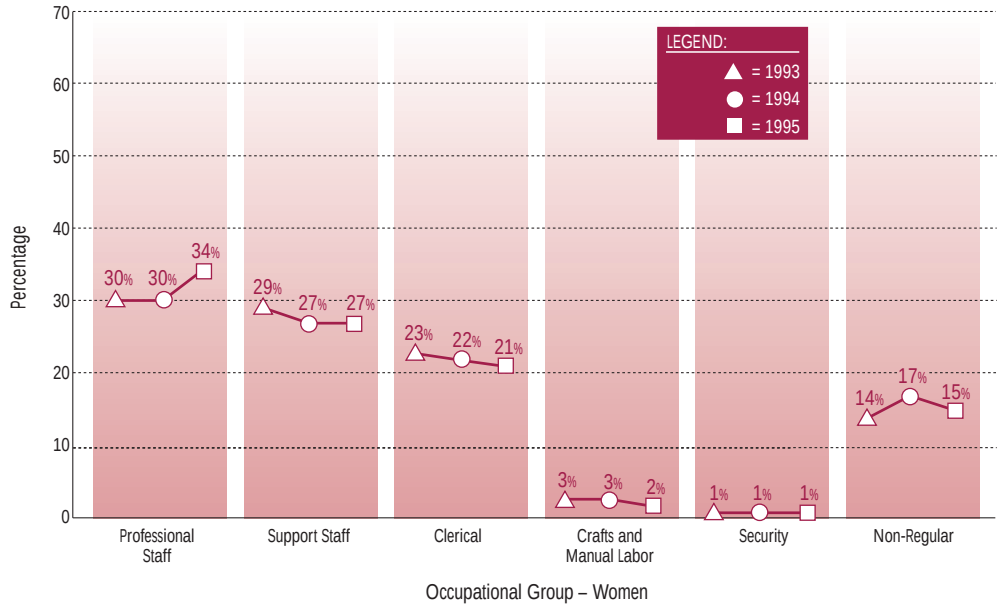


Figure 8. Percentage of Women in Different Occupational Groups, 1993 to 1995



Number and Length of Absences

As in previous reports, this report includes absences that lasted at least five consecutive workdays. Epidemiologic surveillance uses the five-day length of absence because DOE Order 440.1 requires contractor management to notify Occupational Medicine when a worker has been absent for five or more consecutive workdays. Although occupational injuries and illnesses must be reported regardless of absence, nonoccupational illnesses and injuries that involve absences shorter than five consecutive workdays do not routinely require a medical clearance for return to work. As a result, nonoccupational injuries and illnesses involving fewer than five workdays are not identified consistently. A change from previous reports is the removal of absences that lasted at least five consecutive workdays but did not result from an illness or injury. These included 14 different workers with 15 absences for elective surgical procedures not related to treatment of an illness or injury. Throughout this report, the analyses take gender, age, and occupation into account because the risk of illness and injury varies by these factors. For analyses that examine duration of absence, the reported number of days absent includes weekends unless otherwise stated.

The percentage of men with at least one absence increased with age to a high of 13% of those aged 60 and over. The same trend was seen among women with 22% of those aged 60+ reporting at least one nonoccupational absence of five or more workdays. The percentage of women with at least one absence (12%) was twice that of men (6%) (figure 9). This gender difference, seen at Sandia every year since the site's first Epidemiologic Surveillance report in 1993, is similar to the pattern observed at other sites. An explanation of how these percentages were calculated is in the shaded box accompanying figure 9.

The duration of absence among men increased steadily with age while among women the duration tended to decrease as age increased (figure 11). Women under 40 years old had substantially longer absences than men in this age group (29.2 days for women versus 18.8 days for men). Maternity leave may have contributed to the longer average duration of absences observed among younger women. Pregnancy/childbirth accounted for 2,307 days of absence and was one of the two most frequently reported diagnostic categories for women in the 16-39 age group (figure 15, appendices F and G).

How Are Percentages Calculated?

The percentages are calculated by dividing the number of workers with at least one absence in a given age and gender group by the number of employees in the same group. This number is multiplied by 100 to give a percent. The number of employees in each group is shown in figure 1. An example is given below:

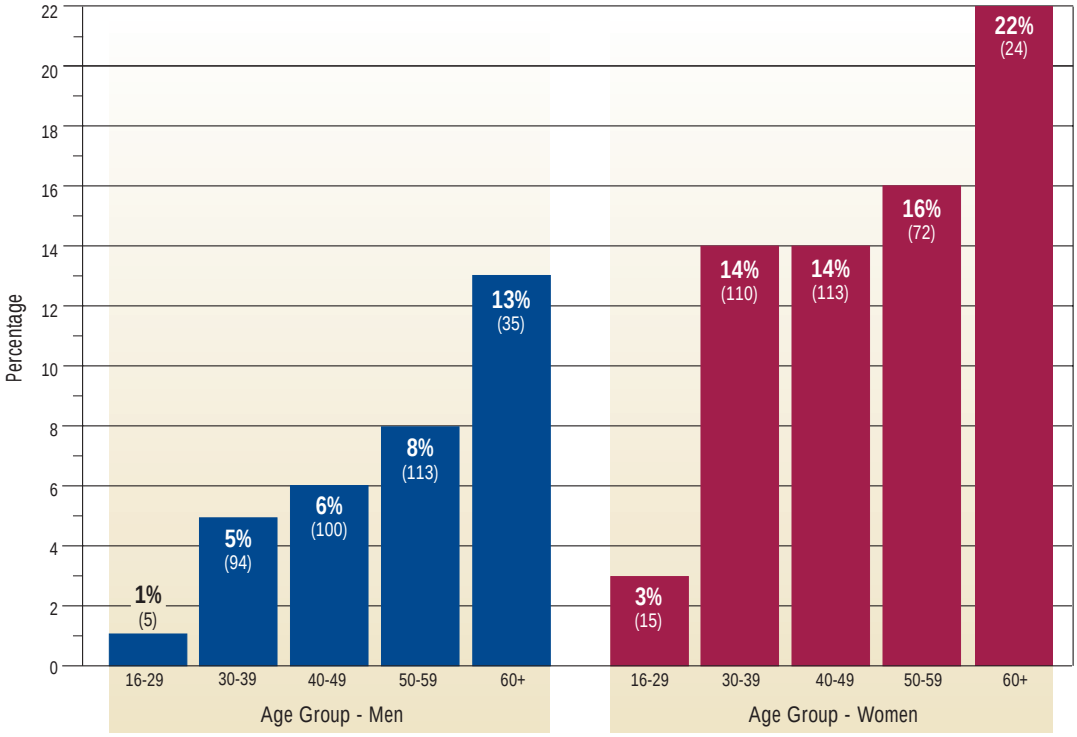
5 (number of men aged 16-29 with at least one absence from figure 9)

÷505 (number of men in the work force aged 16-29 from figure 1)

= .010 x 100 = 1%

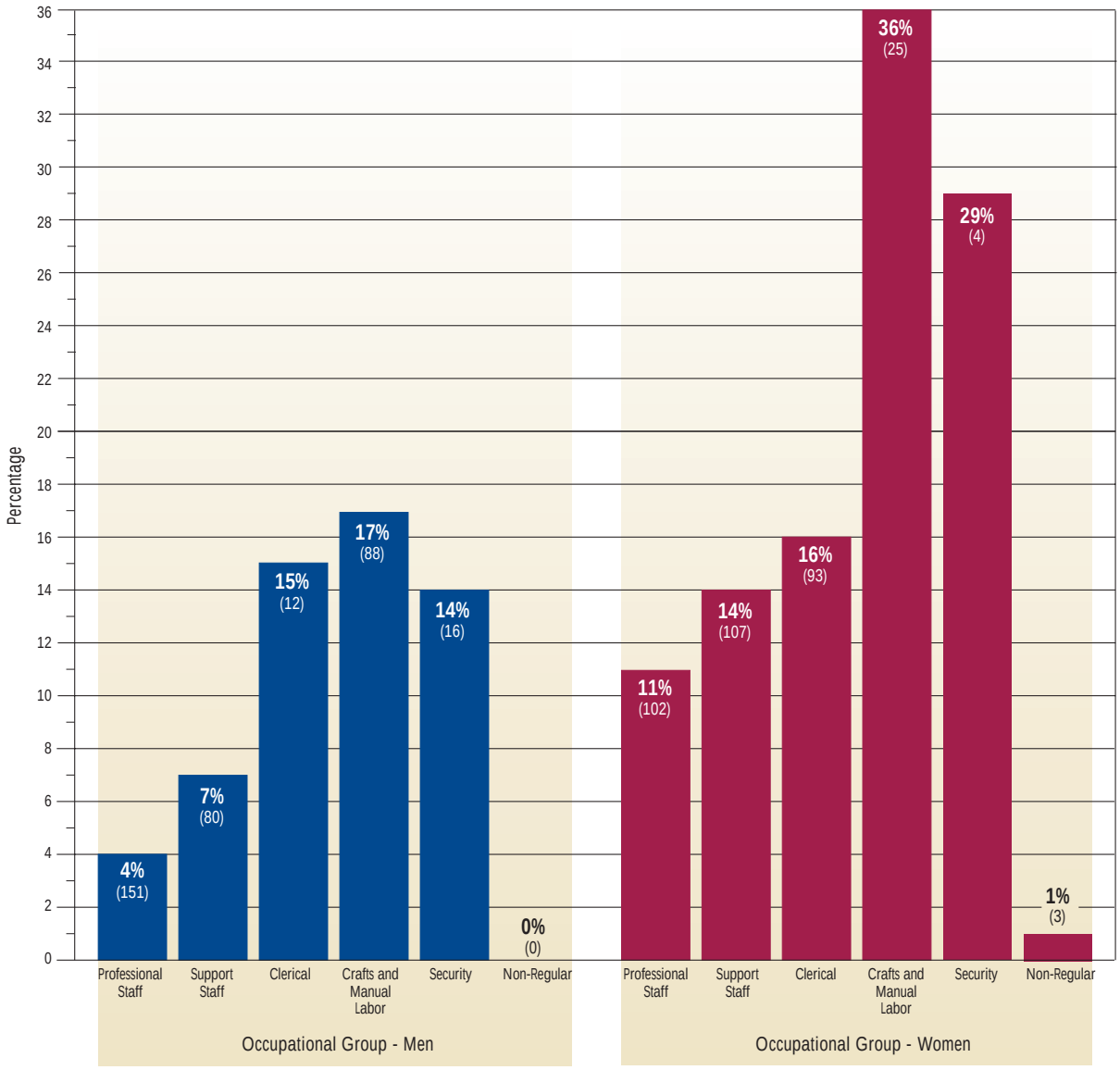
The crafts and manual labor group had the highest percentage of workers with an absence; 17% of the men and 36% of the women reported at least one absence (figure 10). For men and women combined, the average duration of absence was highest for the non-regular (28.0 days) workers and lowest for clerical workers (19.8 days). All other occupational groups had an average duration of absence in the 20 to 25 day range (figure 12). The long average duration of absences among non-regular workers resulted from two of the three absences reported in this group. Both absences were related to pregnancy and lasted 33 and 42 days. Additional information about the number and length of absences for men and women in different age and occupational groups is in appendices B-E. The Rates of Disease Occurrence section of this report, beginning on page 16, examines the diagnoses underlying these absences.

Figure 9. Workers with at Least One Absence by Gender and Age*



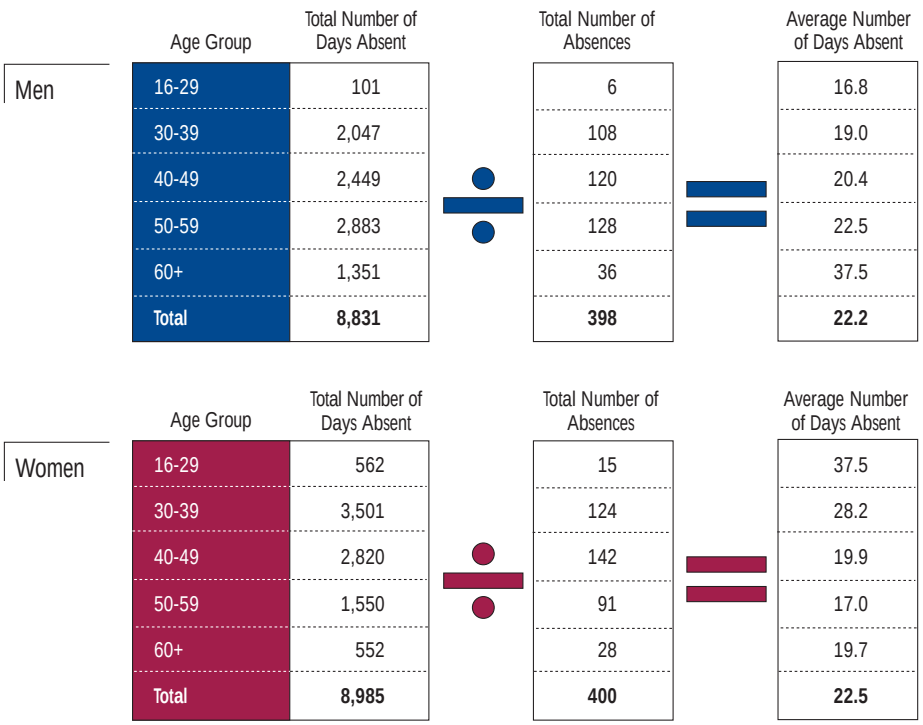
*Numbers in parentheses represent the number of workers with at least one absence.

Figure 10. Workers with at Least One Absence by Gender and Occupation*



*Numbers in parentheses represent the number of workers with at least one absence.

Figure 11. Number of Days Absent by Gender and Age



Men

Age Group	Total Number of Days Absent	Total Number of Absences	Average Number of Days Absent
16-29	101	6	16.8
30-39	2,047	108	19.0
40-49	2,449	120	20.4
50-59	2,883	128	22.5
60+	1,351	36	37.5
Total	**8,831**	**398**	**22.2**

Women

Age Group	Total Number of Days Absent	Total Number of Absences	Average Number of Days Absent
16-29	562	15	37.5
30-39	3,501	124	28.2
40-49	2,820	142	19.9
50-59	1,550	91	17.0
60+	552	28	19.7
Total	**8,985**	**400**	**22.5**

Figure 12. Number of Days Absent by Gender and Occupation

Men

Occupation	Total Number of Days Absent	Total Number of Absences	Average Number of Days Absent
Professional Staff	3,080	165	18.7
Support Staff	2,595	86	30.2
Clerical	197	15	13.1
Crafts and Manual Labor	2,599	112	23.2
Security	360	20	18.0
Non-Regular	0	0	0.0
Total	**8,831**	**398**	**22.2**

Women

Occupation	Total Number of Days Absent	Total Number of Absences	Average Number of Days Absent
Professional Staff	2,890	119	24.3
Support Staff	2,688	128	21.0
Clerical	2,318	112	20.7
Crafts and Manual Labor	883	34	26.0
Security	122	4	30.5
Non-Regular	84	3	28.0
Total	**8,985**	**400**	**22.5**

Diagnostic Categories

Epidemiologic surveillance monitors both occupational and nonoccupational illnesses and injuries among active workers. In many cases it is not possible to say with certainty what caused the health problem, so epidemiologic surveillance assesses the health of the work force by including both occupational injuries and illnesses and diagnoses that are not necessarily attributed to workplace exposures. Most of the diagnoses are reported by the workers when they visit their site's occupational medicine clinic for a return-to-work clearance following an absence. In contrast, illness and injury diagnoses are recorded on the OSHA 200 Log because they are occupationally related. We conduct separate analyses of the occupational injuries and illnesses recorded in the OSHA 200 Log because they have been designated as occupational, whether or not they involve an absence.

This report presents diagnosis categories based on the type of disease or condition (e.g., cancer) or body system (e.g., lung/respiratory) affected. For example, rheumatism is one diagnosis under the diagnostic category of muscles and skeleton. Bronchitis is a diagnosis in the lung/respiratory category. You can find specific diagnoses in the Explanation of Diagnostic Categories on pages 40-44 of this report. An absence can involve more than one diagnosis, and epidemiologic surveillance includes all diagnoses reported. If a worker reported more than one diagnosis for a single absence and all of these diagnoses fell into the same diagnostic category, all of them were still counted.

The most frequently reported diagnosis categories remained the same from 1993 through 1995. Diagnoses involving the lung/respiratory system, the muscles and skeleton, and injuries consistently had the highest rates among both men and women. These categories tended to reflect the most calendar days of absence (figure 13). For all three years, women had much higher respiratory diagnosis rates than did men, a difference also observed at other epidemiologic surveillance sites. Diagnosis rates involving the muscles and skeleton were about twice as high among women as men. Some of the more common diagnoses within the frequently occurring categories are shown in figure 14.

The types of diagnoses observed within the more common diagnostic categories were generally similar to those observed at other epidemiologic surveillance sites. At Sandia, acute respiratory infections, flu, and pneumonia accounted for over a third (36%) of the lung/respiratory diagnoses reported. Sinusitis and bronchitis made up another third (37%) of the diagnoses. Sprains and stains accounted for 35% of the injuries and poisonings. Fractures, dislocations, and unspecified injuries made up most of the remainder. A third of the diagnoses involving the muscles and skeleton were arthritis and joint disorders, and about a quarter each were disorders of the back, disc, or neck (25%) and rheumatism and acquired limb deformities (27%).

The more frequently reported diagnoses varied with age and gender (figure 15 and appendix F). Among men, injury and poisoning diagnoses were among the most frequently reported in all age groups. Among men under age 60, respiratory and digestive disorders were also common. Among the 72 diagnoses for digestive disease, 26% were hernias, 17% were for enteritis or colitis, and 11% for gallbladder disease. Half of the 10 heart/circulatory diagnoses reported by 7 men age 60 or older were for ischemic disease (including restricted blood flow to an artery and heart attack).

Diagnoses involving the lung/respiratory system were among the top categories reported for women of all ages. The types of conditions were similar to those reported by men. Pregnancy/childbirth was among the most frequently reported conditions reported by women under 40. Diagnoses related to the muscles and

skeleton were common in women in all age groups except 60+. Women reported more rheumatism (42%) than did men (14%). Four of the six injury diagnoses reported by women 60 years and older were fractures.

We observed more similarities than differences among occupational groups in the occurrence of illness and injury. Lung/respiratory diagnoses were common in all occupational groups except the non-regular category. Diagnoses for injury and poisoning also occurred relatively frequently in this work force. Only 3 of the 116 diagnoses were related to poisoning; all were allergic reactions. Complications of medical care are also included in the injury and poisoning category; 4 such diagnoses were reported. Injury and poisoning was one of the more common diagnostic categories for men in the support staff, crafts and manual labor, and security groups and women in the support staff and security groups (figure 16). Over a third of the injuries reported were sprains and strains, with fractures and dislocations making up an additional 42% (appendix H). Injuries, both occupational and nonoccupational, affect many occupational groups and are not confined to a narrow age range (figures 15 and 16).

Other sections of this report focus specifically on job-related diagnoses that are reported under the Occupational Safety and Health Administration (OSHA) guidelines.

Figure 13. Total Number of Diagnoses Reported and Total Number of Days Absent from Work by Gender and Diagnostic Category

	Men		Women	
Diagnostic Category	Total Number of Diagnoses Reported	Total Number of Days Absent	Total Number of Diagnoses Reported	Total Number of Days Absent
Benign Growths	5	67	20	596
Blood	2	177	9	291
Cancer	15	418	14	373
Digestive	75	1,243	36	570
Endocrine/Metabolic	9	170	8	112
Existing Birth Condition	1	45	3	51
Genitourinary	18	337	48	1,265
Heart/Circulatory	47	3 1,992	17	530
Infections/Parasites	27	696	18	346
Injury and Poisoning	3 77	1 2,426	39	798
Lung/Respiratory	1 119	1,656	1 142	3 1,605
Mental	7	160	24	683
Muscles and Skeleton	2 80	2 2,222	2 73	2 1,943
Nervous System	28	785	28	437
Pregnancy/Childbirth	0	0	3 49	1 2,551
Skin	13	553	8	200
Unspecified Symptoms	36	944	37	676

Figure 14. Diagnoses Reported Under Selected Diagnostic Categories by Gender

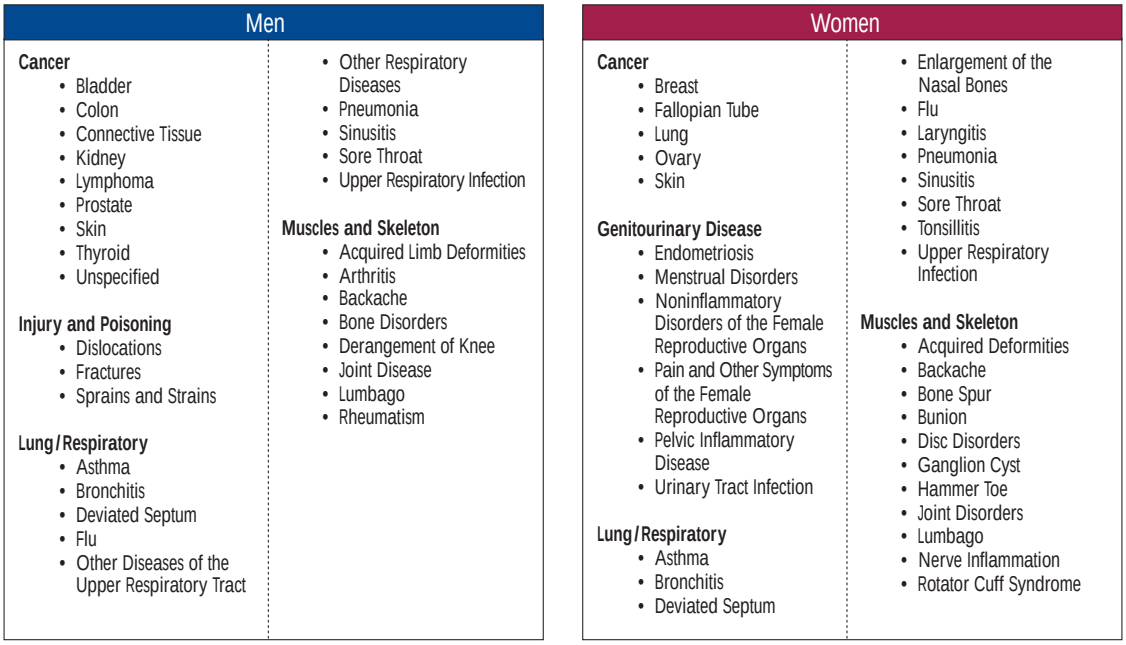


Figure 15. Three Diagnostic Categories Reported Most Often by Gender and Age

		16-29	30-39	40-49	50-59	60+
Men	Most Common Diagnostic Category	Infections/Parasites; Injury and Poisoning	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory	Muscles and Skeleton
	Second Most Common Diagnostic Category	Digestive; Muscles and Skeleton	Injury and Poisoning	Muscles and Skeleton	Digestive	Heart/Circulatory
	Third Most Common Diagnostic Category	None	Digestive	Digestive; Injury and Poisoning	Injury and Poisoning	Injury and Poisoning
Women	Most Common Diagnostic Category	Pregnancy/Childbirth	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory
	Second Most Common Diagnostic Category	Muscles and Skeleton	Pregnancy/Childbirth	Muscles and Skeleton	Muscles and Skeleton	Injury and Poisoning
	Third Most Common Diagnostic Category	Injury and Poisoning; Lung/Respiratory	Muscles and Skeleton	Genitourinary	Unspecified Symptoms	(1)

(1) More than two diagnostic categories tied.

Figure 16. Three Diagnostic Categories Reported Most Often by Gender and Occupation

		Professional Staff	Support Staff	Clerical	Crafts and Manual Labor	Security	Non-Regular
Men	Most Common Diagnostic Category	Digestive	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory	Injury and Poisoning	None
	Second Most Common Diagnostic Category	Lung/Respiratory; Muscles and Skeleton	Injury and Poisoning	Nervous System	Muscles and Skeleton	Digestive; Lung/Respiratory	None
	Third Most Common Diagnostic Category	Heart/Circulatory	Muscles and Skeleton	(2)	Injury and Poisoning	Muscles and Skeleton	None
Women	Most Common Diagnostic Category	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory	Pregnancy/Childbirth
	Second Most Common Diagnostic Category	Pregnancy/Childbirth	Muscles and Skeleton	Muscles and Skeleton; Unspecified Symptoms	Muscles and Skeleton	Injury and Poisoning; Mental	Digestive
	Third Most Common Diagnostic Category	Genitourinary	Injury and Poisoning	Genitourinary	Heart/Circulatory	Pregnancy/Childbirth (1); Unspecified Symptoms (1)	None

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Rates of Disease Occurrence

Because the occurrence of illness and injury among a small number of workers can vary widely just by chance, rates calculated for small groups can appear very different even though they are all in the same range. One way to address this problem is to analyze fewer, more broadly defined groups. For the analyses shown in figures 17 and 18, we combined the five age groups into two age groups. The broad age groups, less than 40 years and 40 years and older, were chosen because the rates of many illnesses begin to change more rapidly among persons over 40 years of age.

The likelihood of getting cancer increases with age, and all but one of the cancer diagnoses were reported among older workers (appendix F). Although this report discusses cancer diagnosis rates, one cancer can be associated with several absences over a year. The rates are not comparable to incidence rates, which reflect the number of *new* cancer diagnoses in a population over a specified period of time (usually one year). Incidence rates count a cancer diagnosis only once, but a worker who is absent for a week on four different occasions during the same year could have four cancer diagnoses recorded for epidemiologic surveillance. Cancer rates presented in this report are really absence rates related to cancer, and because a worker may experience several absences related to the same cancer diagnosis, the cancer rates in this report can appear substantially higher than the actual incidence of cancer. The 29 cancer diagnoses reported during 1995 included 14 diagnoses among 8 women and 15 diagnoses among 15 men. In 1994, 8 women reported 8 cancer diagnoses and 15 men reported 17 cancer diagnoses. One woman reported six cancer diagnoses in 1995. The cancer rates were highest among support staff aged 40 and above, but there was no evidence of an excess of any particular type of cancer. Two men (prostate, unspecified) and five women (lung, skin, breast, two ovary) workers reporting cancer were in this occupational group. Among the eight women who reported cancer, three had breast cancer and three reported cancer of the ovary. Six of the 15 men reported prostate cancer.

Of the 64 heart/circulatory diagnoses reported, 7 occurred among workers under age 40 (figure 18, appendix F). Four of the seven diagnoses were hemorrhoids and varicose veins. The remaining 57 diagnoses

A Word about Rates...

The previous discussion considered the **number** of diagnoses among various groups, but comparing these numbers may be misleading. For example, figure 13 shows that during 1995 men reported 77 diagnoses involving injuries; women reported 39. You can honestly say that men reported twice as many injuries as women. Does this mean that men were at greater risk of injury in 1995? Comparing the number of injuries among men versus women will not answer this question. To answer the question, the number of men and women in the work force must be considered. Since there are over twice as many men as women at Sandia, it is reasonable to expect more injuries among men than women. A more accurate way to compare men and women is to calculate the injury rate for each group. The rates are calculated by dividing the number of injuries in a given group by the number of employees in the same group. The number is multiplied by 1,000 to give a rate per 1,000. For example:

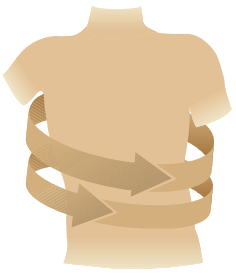
(77 injuries ÷ among 5,758 men) = .0134 x 1,000 = 13.4 injuries per 1,000 men

(39 injuries ÷ among 2,710 women) = .0144 x 1,000 = 14.4 injuries per 1,000 women

These rates account for differences in the number of men and women in the work force, and comparing them suggests that the rate of reported injuries among women is about the same as that of men. They are called **crude rates** because they do not account for possible differences between men and women with regard to age, occupation, and other factors that might affect an individual's risk of getting an injury. Not all age groups are equally susceptible to various diseases and injuries, so epidemiologists often take age into account when calculating rates. For example, figure 20 of this report shows that injury rates vary not only by occupation, but also by both age and gender. Because these differences can be dramatic, age-specific rates for workers under age 40 and those age 40 and older are presented in this section of the report. Definitions of diagnostic rates and age-specific rates also appear in the Glossary of this report.

Figure 17. Rates per 1,000 for All Diagnostic Categories Combined by Gender, Age, and Occupation

All Diagnostic Categories

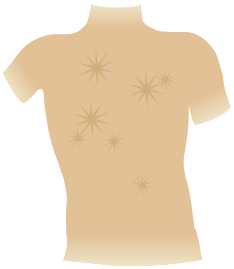


Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Professional Staff	<40	36	140
	40+	79	229
Support Staff	<40	67	233
	40+	152	228
Clerical	<40	313	269
	40+	286	318
Crafts and Manual Labor	<40	306	538
	40+	310	886
Security	<40	246	500
	40+	222	250
Non-Regular	<40	0	8
	40+	0	0

Figure 18. Rates per 1,000 for Selected Diagnostic Categories by Gender, Age, and Occupation

Diagnostic Category

Cancer



Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Professional Staff	<40	0	0
	40+	5	6
Support Staff	<40	0	0
	40+	3	21
Clerical	<40	0	0
	40+	0	3
Crafts and Manual Labor	<40	6	0
	40+	3	0
Security	<40	0	0
	40+	0	0
Non-Regular	<40	0	0
	40+	0	0

(continued)

Figure 18. Rates per 1,000 for Selected Diagnostic Categories by Gender, Age, and Occupation (continued)

Diagnostic Category	Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Heart/Circulatory	Professional Staff	<40	0	0
		40+	10	4
	Support Staff	<40	2	7
		40+	13	13
	Clerical	<40	0	0
		40+	16	8
	Crafts and Manual Labor	<40	19	0
		40+	25	91
	Security	<40	14	0
		40+	22	0
	Non-Regular	<40	0	0
		40+	0	0
Lung/Respiratory	Professional Staff	<40	9	20
		40+	10	45
	Support Staff	<40	7	59
		40+	39	60
	Clerical	<40	188	74
		40+	95	95
	Crafts and Manual Labor	<40	108	192
		40+	70	250
	Security	<40	29	200
		40+	67	0
	Non-Regular	<40	0	0
		40+	0	0
Injury and Poisoning	Professional Staff	<40	2	4
		40+	8	13
	Support Staff	<40	22	11
		40+	23	26
	Clerical	<40	0	17
		40+	32	28
	Crafts and Manual Labor	<40	57	0
		40+	36	23
	Security	<40	101	0
		40+	0	250
	Non-Regular	<40	0	0
		40+	0	0

were reported by workers aged 40 and above; 20 were for ischemic disease (including restricted blood flow through an artery and heart attack) and 16 involved hemorrhoids or diseases of the veins or lymphatic channels. Workers in the crafts and manual labor group had 3 times the risk of heart/circulatory disease than did workers in other occupational groups (appendix J). Among the 16 diagnoses reported by 11 workers in this group, 4 were for hemorrhoids and 4 were for ischemic disease. The work of crafts and manual labor may be more physically demanding than that of some other occupations. If so, heart and circulatory illnesses that force crafts and manual labor to be absent might not require an absence among many other workers. The apparent increased risk may simply reflect a greater likelihood of absence rather than a true increased occurrence of heart/circulatory illnesses among crafts and manual labor.

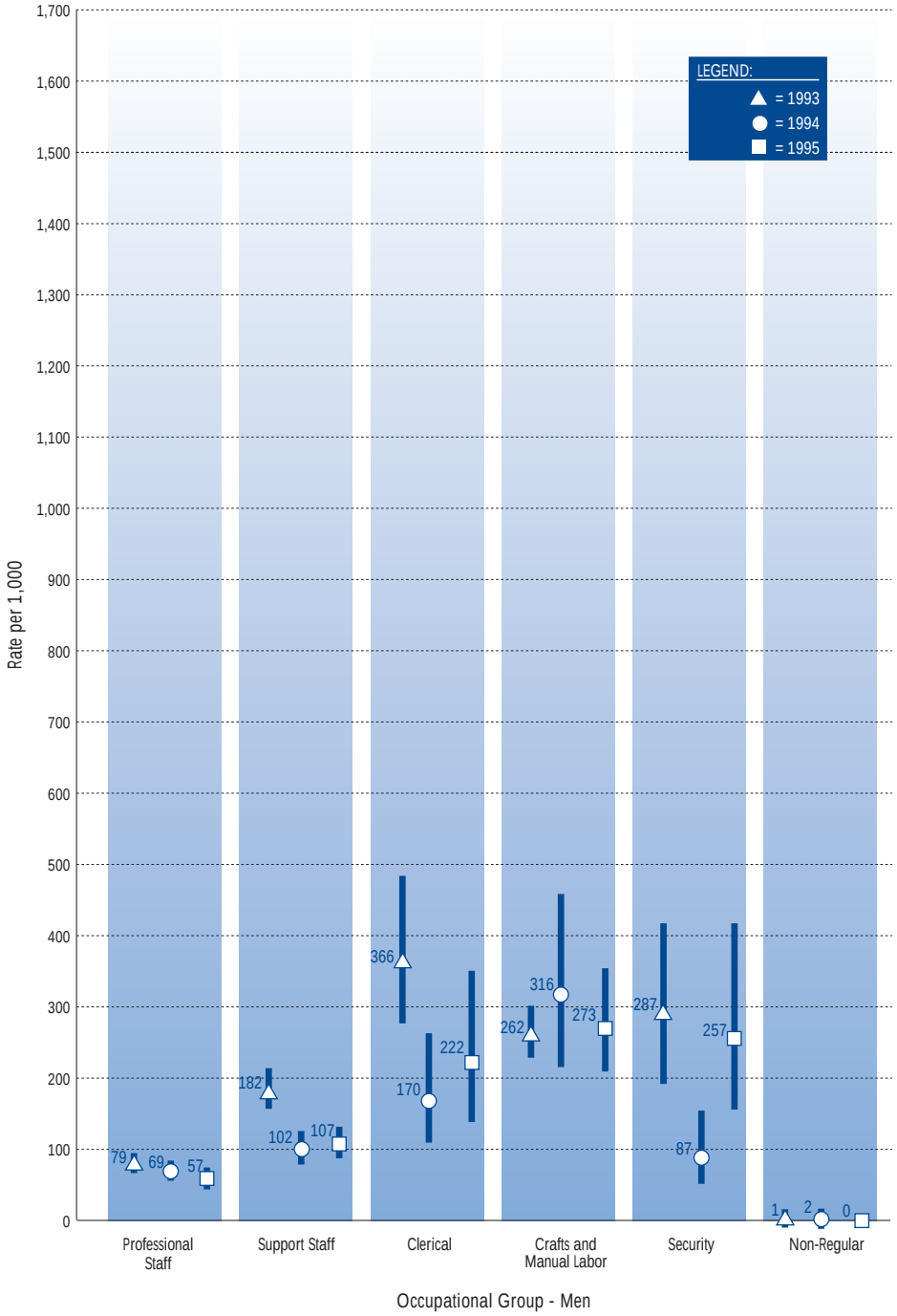
The lung/respiratory diagnosis category contains very different kinds of diseases: acute infectious diseases such as colds, influenza, and pneumonia; allergies, sinusitis, and bronchitis; and chronic diseases like asthma and emphysema. About 70% of the lung/respiratory diagnoses involved acute infections, bronchitis, or sinusitis (appendix F). Women had higher rates of lung/respiratory disease than men, a pattern also observed at other epidemiologic surveillance sites. Lung/respiratory disease rates did not change consistently with age. Clerical workers and crafts and manual labor workers were at higher risk for respiratory disease than were other occupational groups (appendix J). These increased risks reflected an increase in all types of lung/respiratory diseases, not any one in particular (appendix H).

Only 3 of the 116 injury and poisoning diagnoses involved poisoning, so this category really focuses on injuries. Injury rates were higher among older workers except for men in the crafts and manual labor and security groups (figure 18). Overall, injury rates were not markedly different between men and women. For both men and women, about a third of the diagnoses were sprains and strains. Crafts and manual laborers were about three times more likely to have an injury than other workers (appendix J). They were over 4 times more likely to sustain a dislocation, sprain, or strain than other workers. Eight of the 26 sprains and strains and 8 of the 19 dislocations reported by men occurred among crafts and manual labor workers, which made up 9% of the men in the work force (figure 3, appendix H). Their risk of injury relative to other workers was also higher in 1993 and 1994. Similarly, security workers were almost 4 times more likely to report an injury than were workers in other occupational groups. They were about 16 times more likely to sustain a back sprain and strain than other workers. Three of the 12 back sprains and strains reported by men occurred among security workers, who made up 2% of the men in the work force. Security workers were not at increased risk of injury in 1993 or 1994.

Time Trends

Over the three-year period, the rates for all diagnostic categories combined remained fairly constant with two exceptions. Rates declined among men in the support staff group and women in the clerical group from 1993 through 1995. Although rates changed substantially in some occupational groups such as security personnel, we saw no evidence of a consistent increase in disease or injury rates in any occupational group (figures 19 and 20). The large rate fluctuation observed among women in the security group may simply reflect the small number of women in this group (14 in all three years). Small changes in the number of absences in a small group can result in impressive changes in rates (figure 20).

Figure 19. Age-Adjusted Rates for All Diagnostic Categories Combined for Men by Occupation, 1993 to 1995



Rates of cancer, heart/circulatory disease, and injury and poisoning changed little over the three-year period among women in the Sandia work force (figure 21). The high lung/respiratory rates among women were due to many workers having one absence, not to a few workers having many repeated absences. The types of diagnoses were similar among men and women. Over the three-year period the rate of lung/respiratory disease and injury and poisoning dropped significantly among men. The decreased lung/respiratory disease rate resulted from a decrease in all types of lung/respiratory illness rather than any one particular type. The decreased rates of injury and poisoning reflected a decrease in diagnoses for complications of medical care and for a variety of unspecified injuries. Cancer rates among men dropped significantly from 1993 to 1995.

Figure 20. Age-Adjusted Rates for All Diagnostic Categories Combined for Women by Occupation, 1993 to 1995

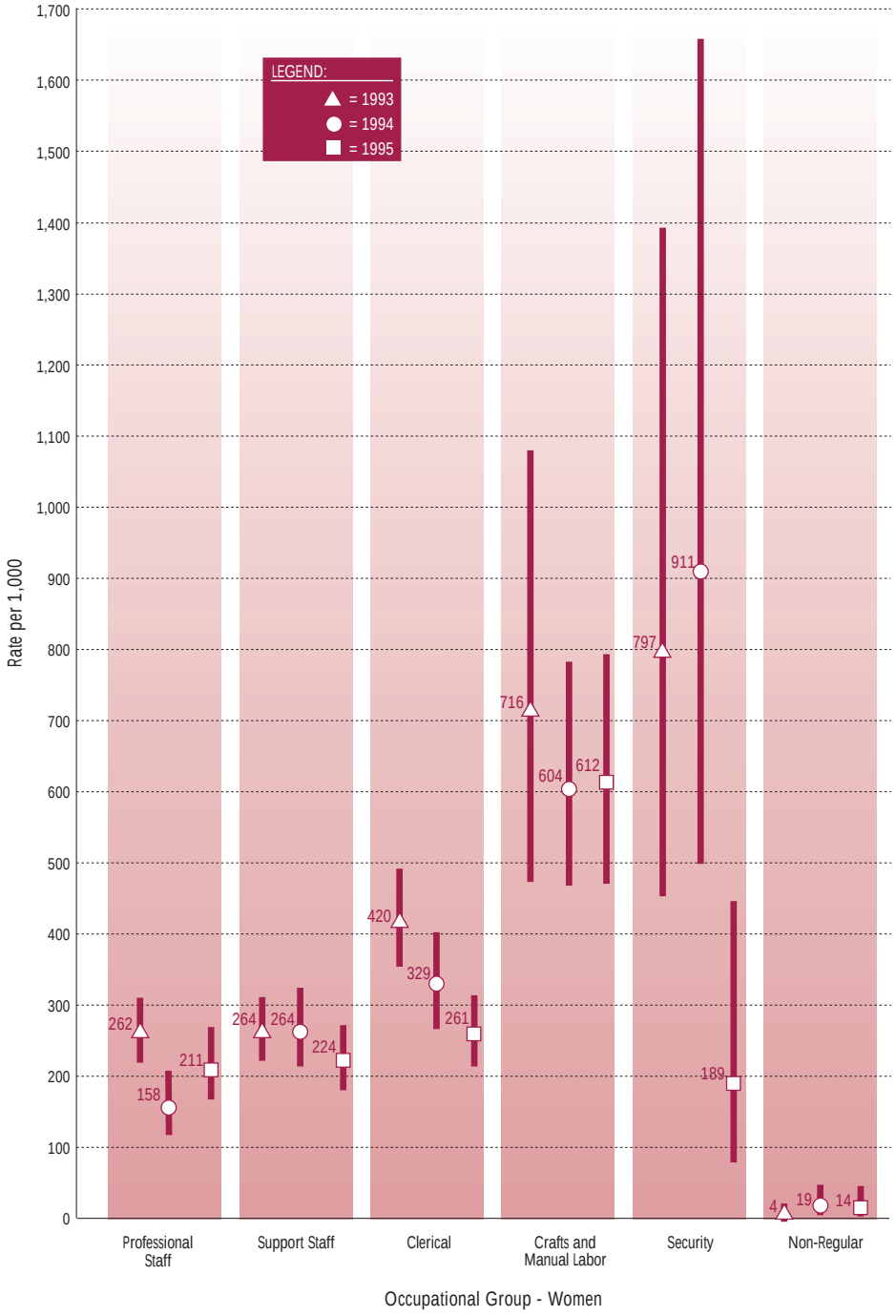
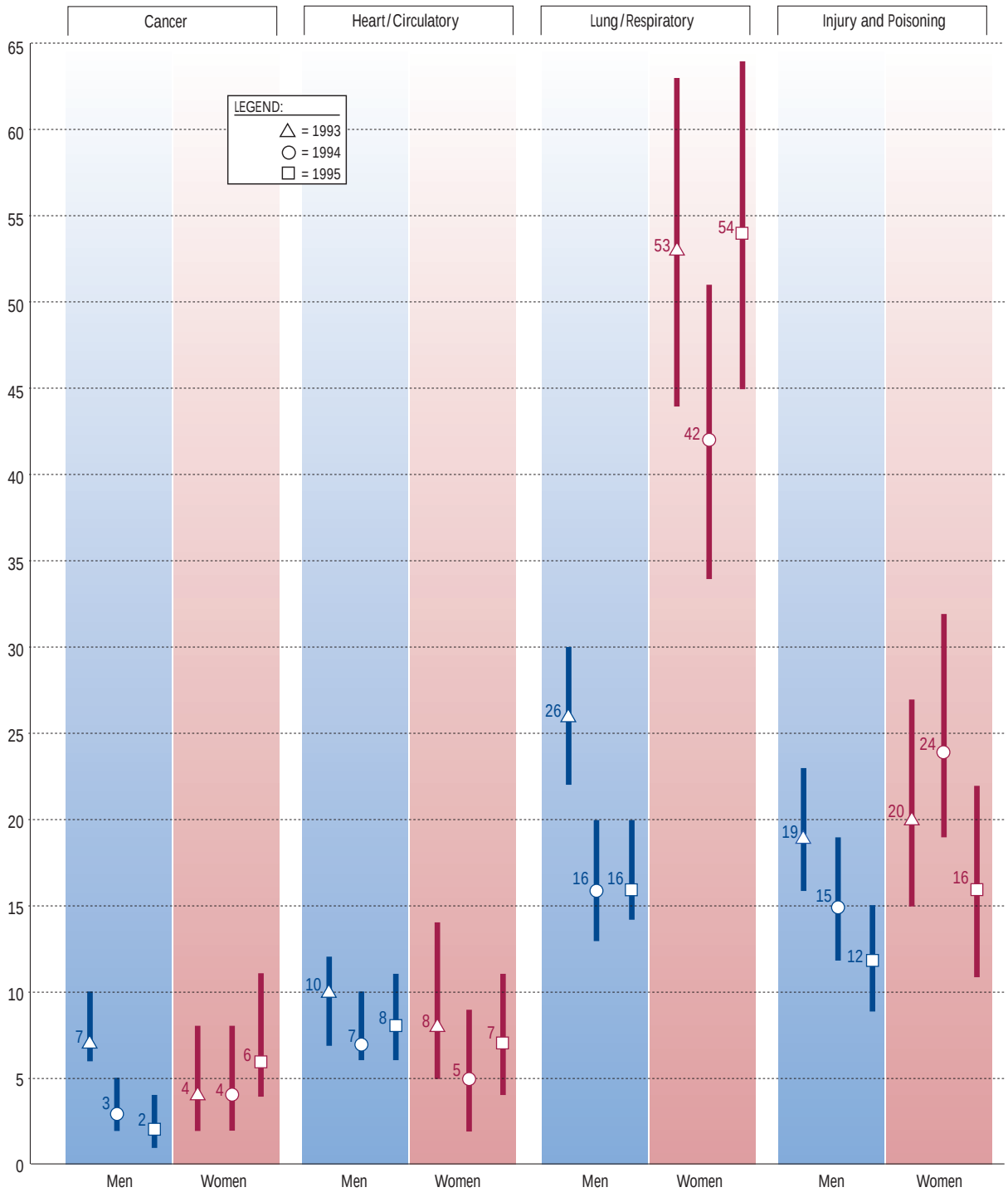


Figure 21. Age-Adjusted Rates for Selected Diagnostic Categories by Gender, 1993 to 1995



Occupational Sentinel Health Events

An occupational sentinel health event (SHEO) is a disease, disability, or injury whose occurrence may serve as a warning signal that workplace conditions may need to be changed or additional attention may be required to reduce its occurrence. Injuries and poisonings resulting from accidents in the workplace and 64 disease conditions have been identified as SHEOs from studies of workplace exposures and disease in many different industries (appendix K). Although SHEOs may indicate an occupational exposure, many SHEOs can also result from nonoccupational exposures or may reflect the combined effects of both occupational and nonoccupational exposures. Because the occupational status of many SHEOs is uncertain, we assess them in the following three categories (appendix K has additional information about what diseases and conditions are included in each SHEO group).

Definitely SHEOs: Consists of diseases that are unlikely to occur in the absence of an occupational exposure. Asbestosis, a lung condition resulting from exposure to asbestos, is an example of this group.

Possibly SHEOs: Includes such conditions as lung cancer and carpal tunnel syndrome, which may or may not be related to occupation. Additional information about the person's hobbies, personal habits, and work history are required to establish a link between disease and occupation. For example, lung cancer can result from asbestos exposure as well as smoking. Carpal tunnel syndrome may result from a job requiring typing or from a hobby such as playing piano.

Accidents: Includes all types of on-the-job accidents and resulting diagnoses. Accidents specifically identified as occurring in the home, on the farm, or during recreation are excluded.

We identified 17 of the 798 absences (2%) reported in 1995 as SHEOs, and 5 of the SHEOs involved accidents (figures 22 and 23). None of the accidents was specifically indicated as occurring in the workplace. Of the 12 SHEOs that did not result from a specific accident, 7 involved carpal tunnel syndrome diagnosed among 6 workers (4 women and 2 men). These 7 events accounted for 28% of the total days absent related to SHEOs. Carpal tunnel syndrome cases were reported in all occupational groups except the security and non-regular groups. All except one of these workers were age 40 years or older. The average length of absence associated with these diagnoses was about 12 days.

Figure 22. Characteristics of Health Events for SHEOs and Days Absent by Gender

		Total Number of Workers	Total Number of Health Events	Total Number of Diagnoses	Total Number of Days Absent
Men	Definite	0	0	0	0
	Possible	7	7	7	224
	Accident	1	1	3	6
	Total	**8**	**8**	**10**	**230**
Women	Definite	0	0	0	0
	Possible	4	5	5	47
	Accident	4	4	7	36
	Total	**8**	**9**	**12**	**83**

Figure 23. Number of Accidents by Gender, Age, and Occupation

Occupation	Age Group - Men 50-59	Age Group - Women 30-39	Age Group - Women 40-49	**Total**
Professional Staff	1	1	0	**2**
Support Staff	0	0	0	**0**
Clerical	0	1	1	**2**
Crafts and Manual Labor	0	1	0	**1**
Security	0	0	0	**0**
Non-Regular	0	0	0	**0**
Total	**1**	**3**	**1**	**5**

Deaths Among Active Workers

Six deaths occurred among active workers in 1995. Five were men and one was a woman. Two deaths were due to heart/circulatory disease, three to cancer, and one to trauma. Five of the six deaths were among the professional staff. Additional characteristics of the workers who died are given in figure 24.

Figure 24. Characteristics of Active Workers Who Died

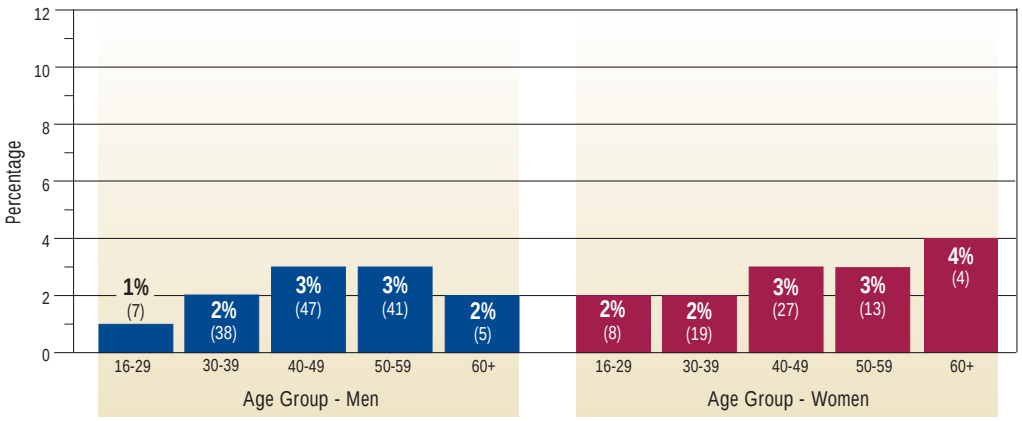
	Age Group - Men				Age Group - Women
Occupation	30-39	40-49	50-59	60+	50-59
Professional Staff	1	0	1	2	1
Support Staff	0	0	0	0	0
Clerical	0	0	0	0	0
Crafts and Manual Labor	0	1	0	0	0
Security	0	0	0	0	0
Non-Regular	0	0	0	0	0
Total	**1**	**1**	**1**	**2**	**1**

OSHA-Recordable Events

The Occupational Safety and Health Administration requires that employers maintain a record of occupational injuries and illnesses occurring among employees and make that information available to OSHA on request. Employers maintain the information from these OSHA-recordable events in the OSHA 200 Log. OSHA-recordable events differ from health events captured through return-to-work clearances in at least two important respects: 1) they do not necessarily result in days lost from work, and 2) they are usually accompanied by a specific determination that they are job-related.

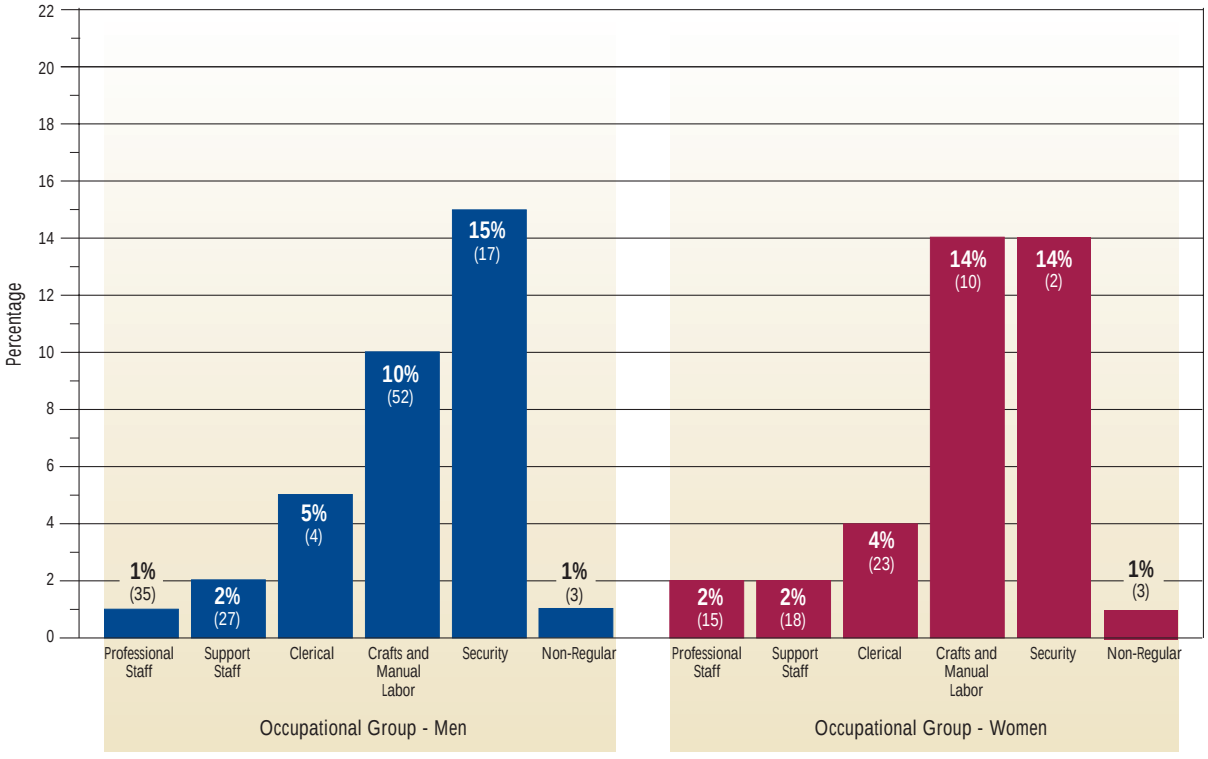
Two hundred nine workers reported at least one OSHA event in 1995 compared with 199 workers in 1994. The percentage of workers with an OSHA event in 1995 was very similar for men and women (about 2.5%). Age was not strongly related to the occurrence of OSHA-recordable injuries (figure 25). The average number of workdays lost or with restricted activity was similar for women and men (about 9 days) and did not appear related to age (figure 27). For men and women combined, security (15%) and crafts and manual labor (11%) workers had the highest percentages of workers with an OSHA event (figure 26). Crafts and manual labor workers had the highest average number of days absent or restricted (15.1 days for men and women combined; figure 28 and appendices L-N).

Figure 25. Workers with at Least One OSHA Event by Gender and Age*



*Numbers in parentheses represent the number of workers with at least one event.

Figure 26. Workers with at Least One OSHA Event by Gender and Occupation*



*Numbers in parentheses represent the number of workers with at least one event.

Figure 27. Lost and Restricted Workdays by Gender and Age

Men

Age Group	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
16-29	40	7	5.7
30-39	488	40	12.2
40-49	483	55	8.8
50-59	278	45	6.2
60+	72	6	12.0
Total	**1,361**	**153**	**8.9**

Women

Age Group	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
16-29	25	8	3.1
30-39	74	21	3.5
40-49	409	31	13.2
50-59	160	15	10.7
60+	22	4	5.5
Total	**690**	**79**	**8.7**

Figure 28. Lost and Restricted Workdays by Gender and Occupation

Men

Occupation	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
Professional Staff	54	35	1.5
Support Staff	110	30	3.7
Clerical	76	5	15.2
Crafts and Manual Labor	910	63	14.4
Security	211	17	12.4
Non-Regular	0	3	0.0
Total	**1,361**	**153**	**8.9**

Women

Occupation	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
Professional Staff	231	16	14.4
Support Staff	63	18	3.5
Clerical	127	23	5.5
Crafts and Manual Labor	234	13	18.0
Security	29	6	4.8
Non-Regular	6	3	2.0
Total	**690**	**79**	**8.7**

Diagnostic and Accident Categories for OSHA-Recordable Events

Seventy-two percent of the diagnoses reported were for injury and poisoning (figure 29). Sprains, strains, and bruises were the most common types of OSHA-recordable injuries among both men and women. Sprains and strains accounted for 47% of all OSHA-recordable injuries in 1995 (52% in 1994); bruises another 16%. Conditions related to the muscles and skeleton also occurred frequently. Age and occupation did not appear related to the type of accident or the type of injury sustained (figures 33-36; appendices O and S).

To be defined as an accident, an OSHA event had to result in a diagnosis of injury or poisoning. Four OSHA events were not the result of a specific accident. Two were related to disorders of the muscles and skeleton and one each to disorders of the skin and the lung/respiratory system.

Among the 228 OSHA-recordable events that included a description of the accident, 39% involved overexertion and strenuous movements and 19% repetitive trauma. Eleven percent of the accidents involved the worker being struck by or striking an object and 9% resulted in falls (figures 30-32). The injuries reported most often by men and women were sprains and strains, followed by bruises and open wounds (figure 33).

Figure 29. Diagnoses by Gender and Diagnostic Category

Diagnostic Category	Total Number of Diagnoses Reported	
	Men	Women
Lung/Respiratory	0	2
Muscles and Skeleton	33	20
Nervous System	2	7
Skin	1	0
Unspecified Symptoms	3	3
Injury and Poisoning	125	61
• Neck and Trunk Fractures	1	0
• Upper Limb Fractures	10	1
• Lower Limb Fractures	1	3
• Dislocations	0	1
• Back Sprains and Strains	34	15
• Other Sprains and Strains	23	16
• Open Wounds - Head, Neck, Trunk	3	0
• Open Wounds - Upper Limb	15	5
• Open Wounds - Lower Limb	3	0
• Superficial Injuries	2	4
• Bruises	19	10
• Foreign Bodies Entering Orifice	3	0
• Burns	7	2
• Unspecified Injuries	2	2
• Adverse Reaction to Nonmedical Substances	2	2

Figure 30. Types of Accidents and the Number of Lost or Restricted Workdays by Gender

Accident Category	Men			Women		
	Number of Accidents	Number of Days Restricted	Number of Days Lost	Number of Accidents	Number of Days Restricted	Number of Days Lost
Motor Vehicle Traffic	2	0	0	0	0	0
Poisoning - Nonmedicinal	1	0	0	3	0	0
Falls	9	153	25	11	77	4
Natural/Environmental Factors	1	0	0	2	0	0
Submersion/Suffocation/Foreign Bodies	3	0	0	0	0	0
Other Accidents	133	1,074	109	63	510	99

Figure 31. Types and Number of Accidents that Occurred Within the Category of Other Accidents by Gender

Other Accidents Category	Number of Accidents	
	Men	Women
Caught Between Objects	11	2
Cutting/Piercing Instrument/Object	13	4
Hot, Corrosive, or Caustic Material/Steam	7	2
Overexertion and Strenuous Movements	64	24
Repetitive Trauma	18	26
Struck by an Object	20	5

Figure 32. Injuries Associated with Each Type of Accident by Gender

	Type of Accident – Men						Type of Accident – Women			
Type of Injury	Motor Vehicle Traffic	Poisoning – Nonmedicinal	Falls	Natural / Environmental Factors	Submersion / Suffocation / Foreign Bodies	Other Accidents	Poisoning – Nonmedicinal	Falls	Natural / Environmental Factors	Other Accidents
Neck and Trunk Fractures	0	0	1	0	0	0	0	0	0	0
Upper Limb Fractures	0	0	2	0	0	8	0	1	0	0
Lower Limb Fractures	0	0	0	0	0	1	0	1	0	2
Dislocations	0	0	0	0	0	0	0	0	0	1
Back Sprains and Strains	2	0	1	0	0	31	0	3	0	12
Other Sprains and Strains	0	0	0	0	0	23	0	4	0	12
Open Wounds – Head, Neck, Trunk	0	0	0	0	0	3	0	0	0	0
Open Wounds – Upper Limb	0	0	1	0	0	14	0	0	0	5
Open Wounds – Lower Limb	0	0	1	0	0	2	0	0	0	0
Superficial Injuries	0	0	1	0	0	1	0	1	2	1
Bruises	0	0	1	0	0	18	1	5	0	4
Foreign Bodies Entering Orifice	0	0	0	0	3	0	0	0	0	0
Burns	0	0	0	0	0	7	0	0	0	2
Unspecified Injuries	0	0	1	0	0	1	0	0	0	2
Adverse Reaction to Nonmedical Substances	0	1	0	1	0	0	2	0	0	0

Figure 33. Three Diagnostic Categories Reported Most Often by Gender and Age

		16-29	30-39	40-49	50-59	60+
Men	Most Common Diagnostic Category	Sprains and Strains	Sprains and Strains	Muscles and Skeleton	Sprains and Strains	Sprains and Strains; Open Wounds
	Second Most Common Diagnostic Category	Open Wounds	Bruises	Sprains and Strains	Open Wounds	Unspecified Symptoms
	Third Most Common Diagnostic Category	Bruises; Burns	Muscles and Skeleton	Bruises	Muscles and Skeleton; Fractures	Fractures (1)
Women	Most Common Diagnostic Category	Muscles and Skeleton	Sprains and Strains	Sprains and Strains	Muscles and Skeleton	Sprains and Strains
	Second Most Common Diagnostic Category	Sprains and Strains; Open Wounds	Muscles and Skeleton	Muscles and Skeleton	Sprains and Strains; Bruises	Muscles and Skeleton; Superficial Injuries
	Third Most Common Diagnostic Category	(2)	Bruises	Nervous System	Unspecified Symptoms	Bruises (1)

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Figure 34. Three Accident Categories Reported Most Often by Gender and Age

		16-29	30-39	40-49	50-59	60+
Men	Most Common Accident Category	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents
	Second Most Common Accident Category	None	Motor Vehicle Traffic	Falls	Falls	Falls
	Third Most Common Accident Category	None	Falls (1)	Submersion/ Suffocation/Foreign Bodies	Motor Vehicle Traffic; Submersion/Suffocation/ Foreign Bodies	None
Women	Most Common Accident Category	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents
	Second Most Common Accident Category	None	Falls	Falls	Poisoning – Nonmedicinal	Falls
	Third Most Common Accident Category	None	Poisoning – Nonmedicinal	Poisoning – Nonmedicinal; Natural/Environmental Factors	Falls (1)	Natural/Environmental Factors (1)

(1) This accident category was reported the same number of times as the one above it.

Figure 35. Three Diagnostic Categories Reported Most Often by Gender and Occupation

		Professional Staff	Support Staff	Clerical	Crafts and Manual Labor	Security	Non-Regular
Men	Most Common Diagnostic Category	Sprains and Strains	Sprains and Strains	Sprains and Strains	Sprains and Strains	Sprains and Strains	Open Wounds
	Second Most Common Diagnostic Category	Open Wounds	Muscles and Skeleton	Muscles and Skeleton	Muscles and Skeleton	Muscles and Skeleton	Bruises (1)
	Third Most Common Diagnostic Category	Muscles and Skeleton	Fractures	Open Wounds (1)	Bruises	Bruises	Burns (1)
Women	Most Common Diagnostic Category	Muscles and Skeleton; Sprains and Strains	Muscles and Skeleton; Sprains and Strains	Sprains and Strains	Bruises	Sprains and Strains	Nervous System
	Second Most Common Diagnostic Category	Unspecified Symptoms	Nervous System	Muscles and Skeleton	Muscles and Skeleton	Muscles and Skeleton	Open Wounds (1)
	Third Most Common Diagnostic Category	(2)	(2)	Nervous System; Open Wounds	Sprains and Strains	None	Superficial Injuries (1)

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Figure 36. Three Accident Categories Reported Most Often by Gender and Occupation

		Professional Staff	Support Staff	Clerical	Crafts and Manual Labor	Security	Non-Regular
Men	Most Common Accident Category	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents
	Second Most Common Accident Category	Falls	Falls	None	Falls	None	None
	Third Most Common Accident Category	Motor Vehicle Traffic	Submersion/ Suffocation/Foreign Bodies	None	Submersion/ Suffocation/Foreign Bodies	None	None
Women	Most Common Accident Category	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents
	Second Most Common Accident Category	Poisoning – Nonmedicinal	Falls	Falls	Falls	None	None
	Third Most Common Accident Category	Falls; Natural/Environmental Factors	Poisoning – Nonmedicinal	Natural/Environmental Factors	None	None	None

Rates of OSHA-Recordable Events

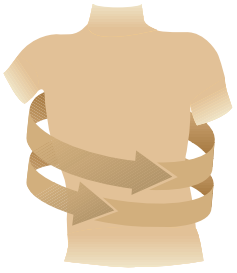
Workers in the security, crafts and manual labor, and clerical groups had the highest rates for all occupational diagnoses combined (figure 37). Most of the OSHA diagnoses involved occupational injury and poisoning (figure 38). When the injury and poisoning category was considered separately, high rates were noted among both men and women in the clerical, crafts and manual labor, and security groups. There does not appear to be a consistent relationship between the age of the worker and the risk of occupational injury at Sandia.

Occupational injuries were responsible for substantial numbers of restricted and lost workdays. Workers in the clerical, security, and crafts and manual labor occupations were more likely to have an OSHA event than other groups (appendix W). Crafts and manual labor workers had the highest average number of lost or restricted workdays (15.1). This group of workers comprised 7% of the work force but had 43% of the lost workdays and 57% of the restricted workdays (appendix N). Security workers made up only 1.5% of the work force but they accounted for 10% of the events, and they had 12% of the restricted workdays and 12% of the lost workdays. These two groups had an overall occupational injury risk almost 7 times greater than other occupational groups.

Compared with other workers, security workers were 6 times more likely to suffer back sprains and strains and over 16 times more likely to suffer other sprains and strains (appendix W). These workers were also about 8 times more likely to experience bruises. Crafts and manual labor workers were about 7 times as likely to sustain sprains and strains as other workers at Sandia. They were also at increased risk for open wounds of the arms and shoulders and bruises. Clerical workers were also at significantly increased risk for back and other sprains and strains compared with the work force as a whole. The magnitude of these risks suggests the need for additional attention concerning injuries among clerical workers, security staff, and crafts and manual laborers. The 127 OSHA events among these three groups of workers resulted in 1,446 days of restricted activity and 141 lost workdays; a substantial loss of productivity.

Figure 37. Rates per 1,000 for All Diagnostic Categories Combined by Gender, Age, and Occupation

All Diagnostic Categories

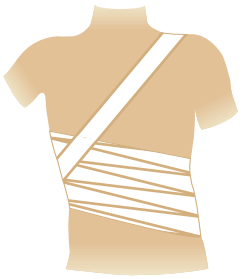


Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Professional Staff	<40	8	22
	40+	12	19
Support Staff	<40	13	15
	40+	39	45
Clerical	<40	125	63
	40+	48	38
Crafts and Manual Labor	<40	127	115
	40+	142	250
Security	<40	159	200
	40+	133	1,000
Non-Regular	<40	8	8
	40+	0	0

Figure 38. Rates per 1,000 for Injury and Poisoning by Gender, Age, and Occupation

Diagnostic Category

Injury and Poisoning



Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Professional Staff	<40	8	13
	40+	9	11
Support Staff	<40	11	11
	40+	28	21
Clerical	<40	63	46
	40+	48	31
Crafts and Manual Labor	<40	115	77
	40+	98	205
Security	<40	101	200
	40+	111	500
Non-Regular	<40	8	5
	40+	0	0

Time Trends for OSHA-Recordable Events

From 1993 through 1995, the overall rates for OSHA-recordable injuries among men and women did not change significantly for any of the occupational groups. For both men and women, the highest rates for this three-year period were seen in the crafts and manual labor and security workers (figures 39 and 40). The rates for occupational injury and poisoning among both men and women were also relatively stable (figure 41).

Figure 39. Age-Adjusted Rates for All Diagnostic Categories Combined for Men by Occupation, 1993 to 1995

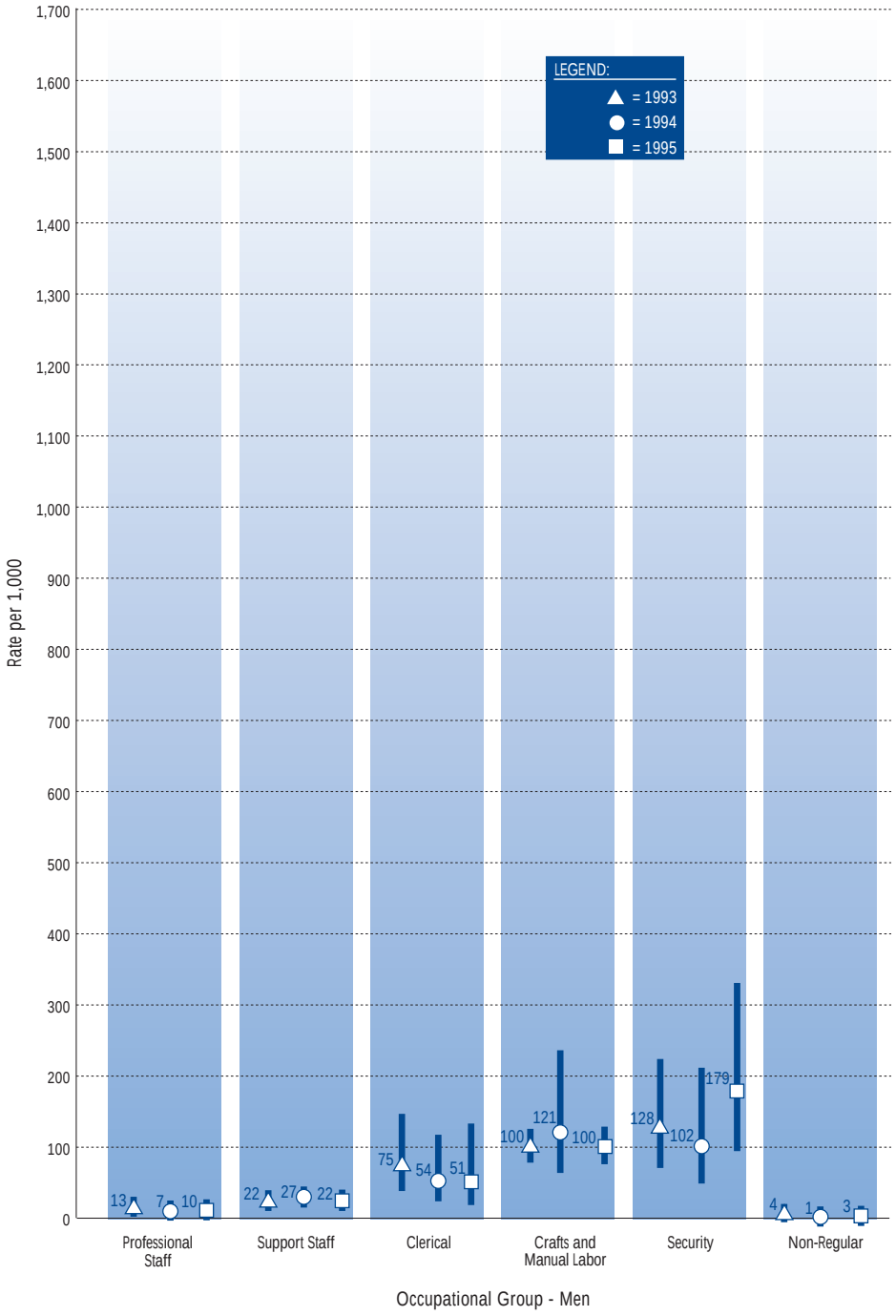


Figure 40. Age-Adjusted Rates for All Diagnostic Categories Combined for Women by Occupation, 1993 to 1995

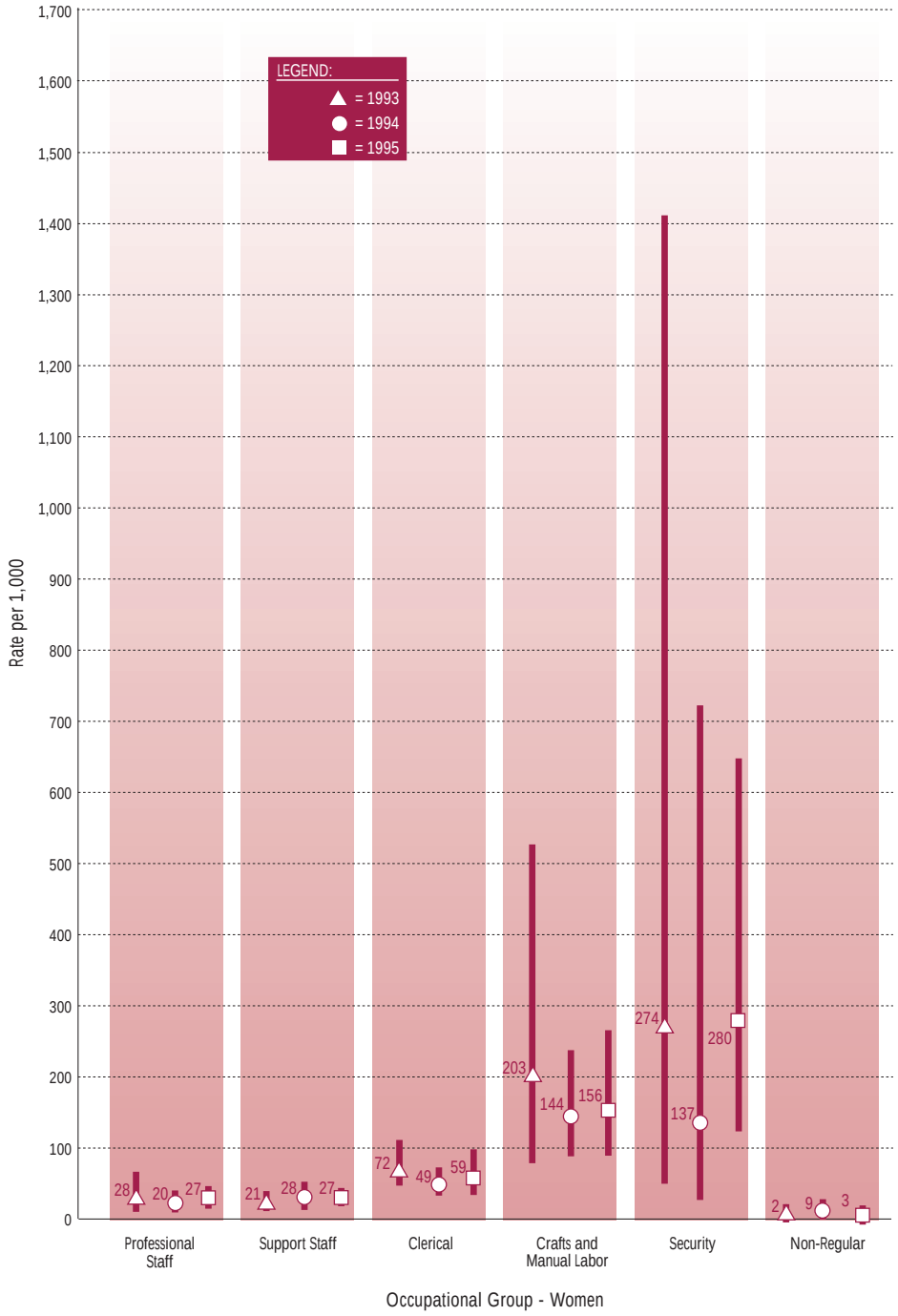
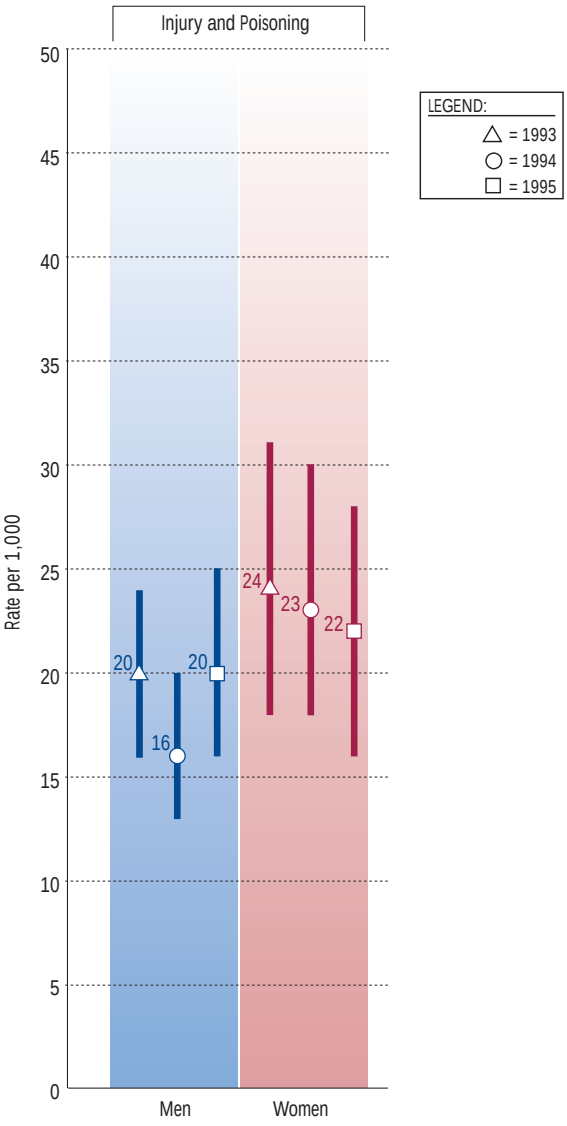


Figure 41. Age-Adjusted Rates for Injury and Poisoning by Gender, 1993 to 1995



Glossary

Adjustment: A mathematical procedure for rates in which the effects of differences of a characteristic (such as age or gender) between groups have been removed. The purpose of adjustment is to allow comparisons between two or more groups with the effect of the differences for the characteristic removed.

Age-Adjusted Rate: A rate that has been mathematically adjusted to account for the effects of differences in the age composition between groups. This allows one rate per group to be compared.

Age-Specific Rate: A rate that is calculated for a group that is a specific age (e.g., 16 to 29 years old). Only people in the specific age group are included in the calculation of the rate. The purpose of calculating age-specific rates is to identify differences in the rate that occur as the age changes. Any differences that are related to age can be seen by comparing age-specific rates for the different age groups.

Confidence Interval: A mathematical procedure used to determine in what range the true value of an event is likely to be. The width of the confidence interval (i.e., how wide the range is) is affected by the size of the group being studied and how often the event whose true value is sought occurs. Generally, as the size of the group or the frequency of the event increases, the width of the confidence interval decreases. The level of confidence, for example a 95% confidence level, indicates the percentage (e.g., 95%) of time that the true value is expected to fall within the confidence interval if the mathematical procedure is repeated 100 times.

Demographics: Characteristics of human populations related to their size, density, distribution, and health.

Diagnosis (diagnoses): A specific disease or medical condition. Diagnoses are grouped together to form diagnostic categories. Tuberculosis is a specific disease that is part of the diagnostic category of infections/parasites. A fractured arm is a specific diagnosis included in the diagnostic category of injury and poisoning.

Diagnosis Rate: The number of occurrences of a given disease or health condition observed among DOE workers during a given time period per 1,000 DOE workers at risk of getting that disease during the time period. It is calculated as follows (using 1995 as the time period):

$$\text{Diagnosis rate for a disease during 1995 (per 1,000 DOE workers)} = \frac{\text{Number of occurrences of the disease reported during 1995}}{\text{Number of DOE workers at risk for the disease during 1995}} \times 1{,}000$$

Diagnostic Category: A particular type of disease, a group of related health conditions, or diseases that all affect the same organ system. Cancer is an example of a diagnostic category that contains a particular type of disease, and pregnancy/childbirth is an example of one that contains a group of related health conditions. Lung/respiratory is an example of a diagnostic category that contains diseases that all affect the same organ system.

Epidemiologic Surveillance: The ongoing evaluation of the health of a human population which is based on the collection and interpretation of demographic and health information for that population.

Epidemiology: The study of the occurrence and distribution of diseases and health conditions in human populations.

Health Event: An absence from work that lasted at least five consecutive workdays.

ICD-9-CM Code: An abbreviation for the *International Classification of Diseases, Ninth Revision, Clinical Modification*. It is internationally accepted as a standardized system for the classification of disease and health data collected from medical records and is useful to describe the disease and health characteristics of a population.

OSHA: An acronym for the Occupational Safety and Health Administration.

OSHA Event: An abbreviation used throughout this report for an OSHA-recordable event.

OSHA-Recordable Event: An accident that occurs on the job and involves fatalities (regardless of time between injury and death), time lost from work, transfer of employment, medical treatment other than first aid, loss of consciousness, or restriction of work or motion. Also included is any diagnosed occupational health event reported to the employer that is neither fatal nor results in workdays lost. By law, these events are recordable in the OSHA 200 Log.

Person-Year: A unit of measurement combining the number of people being studied with the time that each was observed equivalent to one person followed for one year. For example, 5 persons followed for one year contribute five person-years, as do 10 people each followed for half a year. In the epidemiologic surveillance reports, rates are often expressed as the number of events per 1,000 person-years.

Relative Risk: The rate of occurrence of a disease or health condition in one group compared to the rate of occurrence of that same disease or health condition in another group.

Explanation of Diagnostic Categories

Throughout this report, health conditions have been grouped into a number of diagnostic categories which come from the *International Classification of Diseases* (ICD-9-CM). For the text of this report the categories are abbreviated to make the report easier to read. In the appendices a different set of abbreviations was used for the categories. These names are the same as the ones used in previous annual reports. The table that begins on the next page lists the categories in numeric order according to ICD-9-CM and gives examples of common diseases included in each category. The last column of the table below links the category names in the reports and the appendices to the table that begins on the next page.

Diagnostic Categories Used in This Report	Diagnostic Categories Used in the Appendix and Previous Annual Reports	ICD-9-CM Codes
Benign Growths	Benign and Other Neoplasms	210-229,235-239
Blood	Blood and Blood Forming Organs	280-289
Cancer	Malignant Neoplasms	140-208,230-234
Digestive	Digestive System	520-579
Endocrine/Metabolic	Endocrine and Metabolic Diseases	240-279
Existing Birth Condition	Congenital Anomalies	740-759
Genitourinary	Genitourinary System	580-629
Heart/Circulatory	Circulatory System	390-459
Infections/Parasites	Infectious and Parasitic Diseases	001-139
Injury and Poisoning	Injury and Poisoning	800-999
Lung/Respiratory	Respiratory System	460-519
Mental	Mental Disorders	290-319
Muscles and Skeleton	Musculoskeletal System	710-739
Nervous System	Nervous System and Sense Organs	320-389
Pregnancy/Childbirth	Pregnancy and Childbirth	630-676
Skin	Skin and Subcutaneous Tissue	680-709
Unspecified Symptoms	Symptoms, Signs and Ill-Defined Conditions	780-799

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
All conditions	001-V82	All reported health events
Infectious and parasitic diseases	001-139	Diseases caused by bacteria, viruses, and parasites
• Intestinal infections	001-009	Infections of the bowel or gut
• Tuberculosis	010-018	TB in the lungs and other organs
• Zoonotic bacterial diseases	020-027	Bacterial diseases that animals transmit to humans
• Other bacterial diseases	030-041	Whooping cough, diphtheria, strep throat, and gangrene
• Human Immunodeficiency Virus (HIV) infection	042	AIDS
• Poliomyelitis and other nonarthropod diseases of central nervous system	045-049	Viral meningitis (swelling of the layers covering the brain and spinal cord); viral encephalitis (swelling of the brain); and polio
• Viral diseases accompanied by exanthem	050-057	Diseases accompanied by rashes or blisters like chickenpox, measles, shingles, and herpes
• Arthropod-borne viral diseases	060-066	Encephalitis (swelling of the brain) caused by bites from virus-carrying ticks or mosquitoes
• Other diseases caused by viruses and chlamydiae	070-079	Viral hepatitis, mumps, rabies, and mononucleosis
• Rickettsioses and other arthropod-borne diseases	080-088	Rocky Mountain spotted fever, malaria, and lyme disease
• Other spirochetal diseases	100-104	Trench mouth and Weil's disease (jaundice caused by coil-shaped bacteria)
• Mycoses	110-118	Athlete's foot; fungal infections of fingernails and toenails; and thrush
• Helminthiases	120-129	Pinworms, tapeworms, roundworms, whipworms
• Other infectious and parasitic diseases	130-136	Lice, chiggers, scabies, and mites
• Late effects of infectious or parasitic diseases	137-139	Side effects of TB, chickenpox, or polio even though the disease is no longer active
Malignant neoplasms	140-208, 230-234	All cancers, regardless of the part of the body affected
• Lip, oral cavity, and pharynx	140-149	Lip, mouth, throat, and tongue
• Digestive organs and peritoneum	150-159	Cancers of the stomach, esophagus (tube that transports food to the stomach), intestines, colon, rectum, anus, liver, pancreas, and gallbladder
• Respiratory system and intrathoracic organs	160-165	Sinuses, throat, voice box, lungs, and heart
• Bone, connective tissue, and skin	170-173	Bone, muscle, ligament, tendon, blood vessels, fat, and skin
• Genitourinary organs	179-189	Cervix, uterus, prostate, kidney, and bladder
• Other and unspecified sites	190-199	Eye, brain, and thyroid
• Lymphatic and hematopoietic tissue	200-208	Leukemia, lymphoma, Hodgkin's disease, multiple myeloma, lymphosarcoma, and reticulum cell sarcoma
• Carcinoma in situ	230-234	A cancer that is confined to the site of origin (has not spread to neighboring tissue)
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature	210-229, 235-239	Tumors that are not cancerous or do not exhibit cancerous behavior, regardless of the part of the body affected
Endocrine, nutritional, and metabolic diseases and disorders of the immune system	240-279	Diseases affecting the hormone secreting glands and organs. Overactive thyroid; underactive thyroid; vitamin deficiency; diabetes; gout; and problems affecting the antibody producing system
Disorders of the blood and blood forming organs	280-289	Anemia and hemophilia (excludes leukemia)
Mental disorders	290-319	Psychiatric diagnoses - Nonpsychotic disorders: depression; anxiety, fear, and stress disorders; alcoholism; drug dependence; and eating disorders, such as anorexia; Psychotic disorders: dementia, schizophrenia, and manic depression
Diseases of the nervous system and sense organs	320-389	Huntington's chorea; Alzheimer's and Parkinson's disease; epilepsy; multiple sclerosis; migraine; diseases of the eye, such as cataract and glaucoma
• Inflammatory diseases of the central nervous system	320-326	Bacterial meningitis (swelling of the layers covering the brain and spine); bacterial encephalitis (swelling of the brain); and brain and spinal abscesses

(continued)

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
• Hereditary and degenerative diseases of the central nervous system	330-337	Alzheimer's and Parkinson's disease, tremors, and Huntington's chorea
• Other disorders of the central nervous system	340-349	Multiple sclerosis (MS), cerebral palsy, epilepsy, and migraine
• Disorders of the peripheral nervous system	350-359	Nerve disorders of the face, carpal tunnel syndrome, muscular dystrophy
• Disorders of the eye	360-379	Inflammation and ulcers of the eye and eyelid; detached retina; pink eye; problems with tear ducts; glaucoma; and cataracts
• Diseases of the ear and mastoid process	380-389	Infections of the outer, middle, or inner ear; ringing of the ears; hearing loss
Diseases of the circulatory system	390-459	Rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis
• Acute rheumatic fever	390-392	High fever and joint pain with possible heart damage
• Chronic rheumatic heart disease	393-398	Long lasting swelling and damage to the heart which results from rheumatic fever
• Hypertensive disease	401-405	High blood pressure
• Ischemic heart disease	410-414	Heart attack and angina
• Diseases of pulmonary circulation	415-417	Blood clots in the lung and pulmonary aneurysm (bulge that develops in the wall of the pulmonary artery, which is the artery that carries blood to the lungs)
• Other forms of heart disease	420-429	Swelling of the inner lining, middle lining, or sac enclosing the heart; heart failure; and irregular heartbeat
• Cerebrovascular disease	430-438	Stroke, bleeding in the brain, and blockage or low blood flow in blood vessels of the brain
• Diseases of the arteries and capillaries	440-448	Hardening of the arteries; aneurysm (bulge that develops in the walls of arteries); and blood clots
• Diseases of the veins, lymphatics, and other	451-459	Phlebitis (swelling of a vein) and thrombophlebitis (swelling of a vein which has a blood clot)
Diseases of the respiratory system	460-519	Colds, sinusitis, laryngitis, pneumonia, influenza, chronic bronchitis, asthma, and emphysema
• Acute respiratory infections	460-466	Colds, sore throat, sinus infections, swollen tonsils, and bronchitis
• Other diseases of the upper respiratory tract	470-478	Allergies, hay fever, sinus infections, bronchitis, and sore throat that continue for a long time
• Pneumonia and influenza	480-487	"The flu" and pneumonia caused by a bacteria or virus
• Chronic obstructive pulmonary diseases and allied conditions	490-496	Emphysema and asthma
• Pneumoconiosis and other lung diseases caused by external agents	500-508	Black lung; miners' asthma; asbestosis; silicosis; berylliosis; and conditions caused by chemical fumes and vapors
• Other diseases of respiratory system	510-519	Pleurisy (swelling of the lining of the lungs), collapsed lung, and respiratory failure
Diseases of the digestive system	520-579	Diseases affecting the teeth and mouth, salivary glands, digestive tract, and the abdominal cavity. Examples include dental abscess, ulcers, appendicitis, hepatitis (excluding viral hepatitis), cirrhosis of the liver, gallstones, pancreatitis, abdominal hernia, and intestinal polyps
• Diseases of the oral cavity, salivary glands, and jaw	520-529	Tooth problems (too many, too few, abnormal shape or size, cavities, bleeding gums, toothaches), and infections and swelling of the mouth, jaw, and tongue
• Diseases of the esophagus, stomach, and duodenum	530-537	Ulcers of the esophagus (tube that transports food to the stomach), stomach, and small intestine; indigestion; and uncontrollable vomiting
• Appendicitis	540-543	Swelling of the appendix (rupture, surgery, or both may result)
• Hernia of the abdominal cavity	550-553	Ruptures of the groin and diaphragm (muscle which separates the chest area from the lower part of the trunk)
• Noninfectious enteritis and colitis	555-558	Crohn's disease and swelling of the intestine and colon
• Other diseases of the intestines and peritoneum	560-569	Irritable bowel syndrome, blockage of the intestine, constipation, and diarrhea
• Other diseases of digestive system	570-579	Diseases of the liver, gallbladder, and pancreas; hepatitis; blood in stool; and bleeding in the stomach and intestine

(continued)

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
Diseases of the genitourinary system	580-629	Diseases affecting the kidneys, the prostate, and testes; benign breast diseases; infertility (male and female); diseases of the ovary; pelvic inflammatory disease; and menstrual disorders
• Nephritis, nephrotic syndrome, and nephrosis	580-589	Swelling of the kidney; swelling of the small blood vessels in the kidney; and kidney failure
• Other diseases of the urinary system	590-599	Swelling and infection of the kidney and bladder; kidney stones; and difficulty urinating
• Diseases of the male genital organs	600-608	Enlarged prostate; swelling of the scrotum and prostate; and abscess of the prostate
• Disorders of the breast	610-611	Benign tumors, cysts, and infections of the breast
• Inflammatory disease of the female pelvic organs	614-616	Swelling of the uterus, ovary, fallopian tubes, or cervix
• Other diseases of the female genital tract	617-629	Conditions associated with menopause and postmenopause; PMS; infertility; and cramps
Complications of pregnancy, childbirth, and the puerperium	630-676	Miscarriage; complications of pregnancy, such as hemorrhage; pregnancy-related high blood pressure; preeclampsia; and premature labor or other complications of labor
• Ectopic and molar pregnancy	630-633	Development of fetus outside the uterus and growth of cysts
• Other pregnancy with abortive outcome	634-639	Miscarriage and complications associated with miscarriage
• Complications mainly related to pregnancy	640-648	Abnormal bleeding and possible miscarriage; infections; high blood pressure caused by pregnancy; and premature labor
• Normal delivery, and other indications for care in pregnancy, labor, and delivery	650-659	Delivery requiring little or no assistance; multiple births; breech birth; and problems of the fetus or placenta which affect care of mother
• Complications occurring mainly in the course of labor and delivery	660-669	Long labor; unusually fast delivery; and abnormal bleeding after delivery
• Complications of the puerperium	670-676	Infections of the breast; blood clot in lung; and varicose veins
Diseases of the skin and subcutaneous tissue	680-709	Acne, cellulitis, sunburn, psoriasis, and seborrhea
• Infections of the skin and subcutaneous tissue	680-686	Abscesses, boils, hair-containing cysts, and pus-filled blisters
• Other inflammatory conditions of skin and subcutaneous tissue	690-698	Skin rashes caused by detergents, oils, greases, solvents, sun, food, drugs, or medicine
• Other diseases of the skin and subcutaneous tissue	700-709	Corns, calluses, heat rash, swollen hair follicles, acne, and ingrown fingernails and toenails
Diseases of the musculoskeletal system and connective tissue	710-739	Arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated interverte-bral disc ("slipped disc"), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis
• Arthropathies and related disorders	710-719	Arthritis; joint pain and stiffness; and other diseases of the connective tissue which supports and connects internal organs, forms bones and blood vessel walls, and attaches to bones
• Dorsopathies	720-724	Swelling of the spine; rheumatoid arthritis of the spine; lumbago; and sciatica
• Rheumatism, excluding the back	725-729	Swelling and degeneration of joints, muscles, tendons; tennis elbow; and bursitis
• Osteopathies, chondropathies, and acquired musculoskeletal deformities	730-739	Fracture caused by bone disease; osteoporosis; curvature of the spine; flat foot; hammer toe; and development of deformities of the nose, toes, feet, legs, arms, and hands
Congenital anomalies	740-759	Spina bifida; cleft palate; harelip; and various chromosomal anomalies, such as Klinefelter's syndrome
Certain conditions originating in the perinatal period	760-779	Maternal high blood pressure; maternal malnutrition; ectopic pregnancy; breech birth; fetal malnutrition or slow growth; injuries related to birth trauma; and perinatal jaundice
Symptoms, signs, and ill-defined conditions	780-799	Blackout, chills, dizziness, fatigue, pallor, abnormal weight loss, undiagnosed chest pain, and heartburn
• Symptoms	780-789	Hallucinations, fainting, convulsions, dizziness, fatigue, fever, sleep disturbance, rash, headache, sore throat, chest pain, nausea, vomiting, and heartburn
• Nonspecific abnormal findings	790-796	Abnormal x-ray, blood, stool, and urine test results

(continued)

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
• Ill-defined and unknown causes of morbidity and mortality	797-799	Senility; asphyxia; respiratory arrest; nervousness; and unexplained death within 24 hours of onset of symptoms
Injury and poisoning	800-999	Dislocation of joints; sprains and strains of associated muscles; concussions; bruises; cuts; internal injuries from crushing, puncture, tearing or blunt impact; burns; blisters; poisoning; frostbite; heatstroke; and complications of medical or surgical care
• Fractures, all sites	800-829	Cracks or breaks of any bone
• Dislocations	830-839	Separation of a bone from its normal socket or joint
• Sprains and strains of joints and adjacent muscles	840-848	Strains are injuries to muscle from overuse or stretching the muscle beyond its normal limit; sprains are injuries involving tearing or overextending the ligaments of a joint
• Intracranial injuries excluding those with skull fractures	850-854	Concussions; internal bruises; and bleeding within the head without a fracture of the bones of the skull
• Internal injuries of the thorax, abdomen, and pelvis	860-869	Bruising, crushing, tearing, or rupturing the chest, abdomen, and pelvis and the organs within these areas of the body
• Open wounds	870-897	Animal bites; cuts; lacerations; punctures; and amputations, excluding the arteries and veins
• Other injuries and late effects of external causes	900-999	Miscellaneous injuries, including injuries to the arteries and veins; problems that occur an extended period of time after the injury has taken place (“late effects”); superficial bruises and abrasions; burns; post-injury shock; poisoning; toxic side effects of chemicals; heatstroke; electrocution; and altitude sickness
Supplementary classifications related to personal or family history of disease	V10-V19	Covers situations in which the person is not ill or injured but has a personal or family history of problems, such as cancer, mental illness, allergies, or arthritis that may affect his or her risk of illness
Supplementary classifications related to health care for reproduction and child development	V20-V28	Problems related to pregnancy, postpartum care, contraception, outcome of delivery, and physical development of child
Contact with health services for reasons other than illness or injury	V50-V59	Care for workers who have been treated previously for an illness or injury that is no longer present but who receive care to complete treatment or prevent recurrence

Reader Response

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1) Overall, the information in this report was (circle one...)

Too detailed About right Not detailed enough

2) Are there additional topics you would like to see covered in future reports?

Yes No

If yes, please list additional topics:

_____
_____
_____
_____
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_____

3) Please list suggestions for improving the Epidemiologic Surveillance reports:

_____
_____
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4) Which of the following occupational categories best describes the type of work you do? (check one...)

_____ Management/Administrative
_____ Technical
_____ Professional/Scientific
_____ Crafts/Trades
_____ Clerical

5) I am employed by (check one...)

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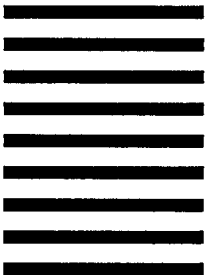

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SNL-AL 1995 Appendices

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